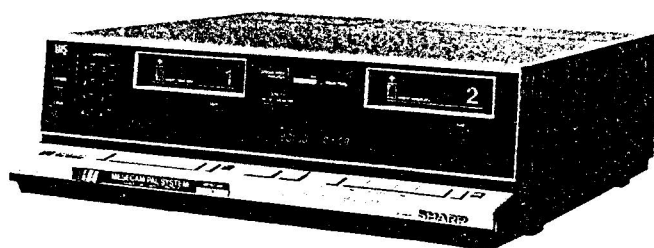


SHARP SERVICE MANUAL

SX4B5VC-5W20E

VHS VIDEO CASSETTE RECORDER



MODEL **VC-5W20E**

In the interests of user-safety (Required by safety regulations in some countries) the set should be restored to its original condition and only parts identical to those specified should be used.

CONTENTS

• SPECIFICATIONS	2
• REMOVAL OF MAIN PARTS	3
• MECHANICAL PARTS LIST AND LAYOUT	4
• ADJUSTMENT, REPLACEMENT, ASSEMBLING AND CLEANING OF MECHANICAL UNITS	5
• ADJUSTMENTS OF ELECTRICAL CIRCUIT	21
• OVERALL SCHEMATIC DIAGRAM	35
• PARTS LIST	89

SPECIFICATIONS

Format:	VHS PAL/ME SECAM standard
Video recording system:	Two rotary head helical scan system
Luminance:	FM recording
Colour signal:	Low frequency converted direct recording.
Video signal:	PAL/ME SECAM colour and B/W signals, 625 lines
Recording/playing time:	4 hours max. with SHARP E-240 tape
Tape width:	12.7 mm
Tape speed:	23.39 mm/sec.
Antenna:	75 ohm unbalanced
Receiving channels:	VHF CH 2—12, UHF CH 21—69
RF converter output signal:	UHF channel 30 to 39 adjustable
Power requirement:	AC 110/127/220/240V Auto, 50/60 Hz
Power consumption:	Approx. 50W (with anti-dew heater)
Operating temperature:	5°C to 40°C
Storage temperature:	—20°C to 55°C
Weight:	16 kg
Dimensions:	450 mm (W) x 450 mm (D) x 135 mm (H)
VIDEO	
Input:	1.0 Vp-p, 75 ohm
Output:	1.0 Vp-p, 75 ohm
AUDIO	
Input:	Line: —11 dB, more than 50k ohm
Output:	Line: —5 dB, less than 1k ohm
Accessories included:	Antenna 75 ohm coaxial connector cable (plug provided) Owner's Manual
Note:	* As part of our policy of continuous improvement, we reserve the right to alter design and specifications without notice. The antenna must correspond to the new standard DIN 45325 (IEC 169-2) for combined VHF/UHF antenna with 75 ohm connector.

[1] REMOVAL OF MAIN PARTS

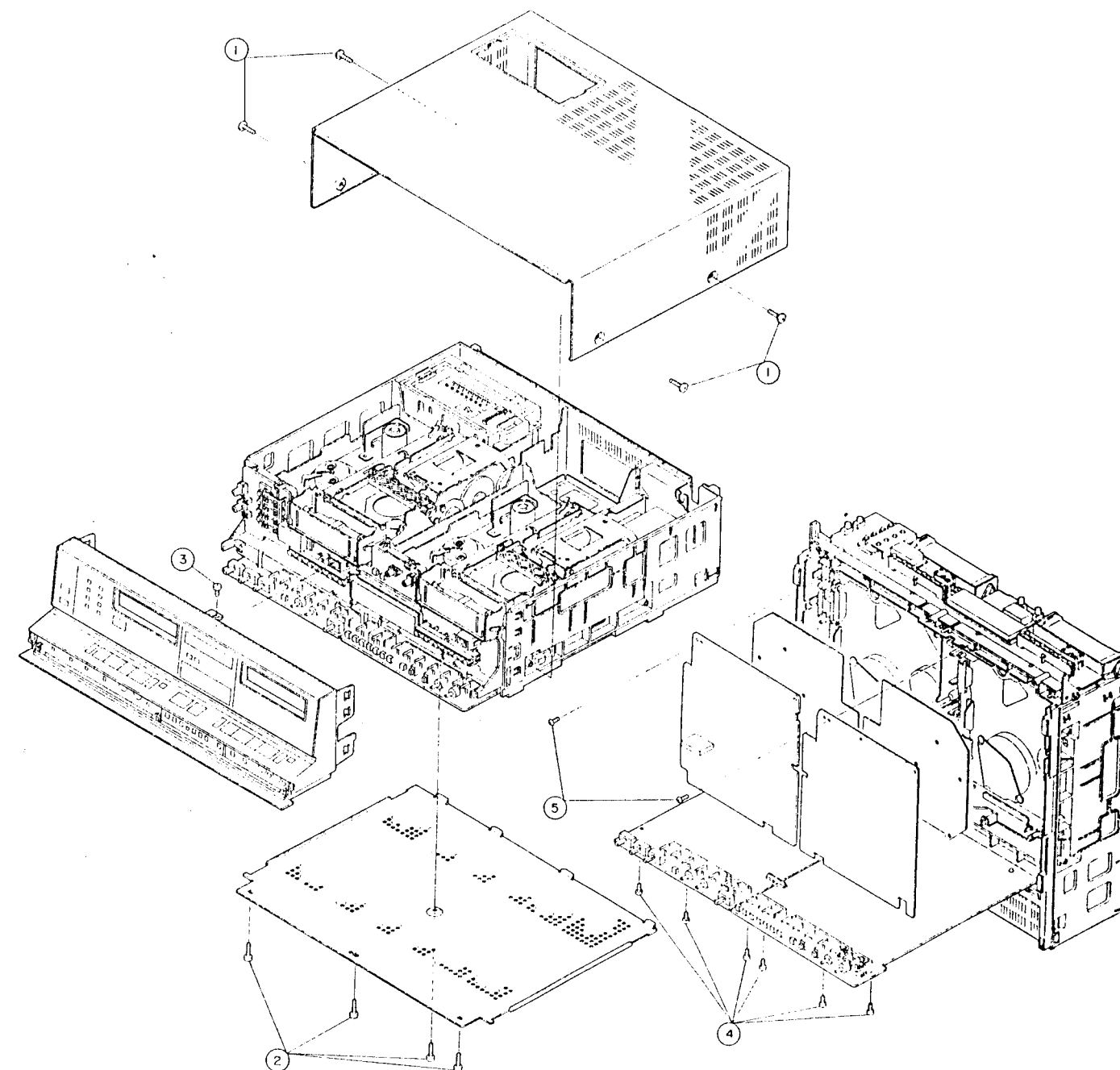


Figure 1.

- Removal of cabinet parts

- ① Remove the four fixing screws from the top panel.
- ② Remove the four fixing screws from the bottom plate.
- ③ Remove the one fixing screw from the front panel.

- Removal of system control PWBs and Y/C PWBs.

- ④ Remove the six fixing screws from the two pieces of system control PWBs which appears on reference number ④.
- ⑤ After removing the two pieces of system control PWBs, remove the two fixing screws from the two pieces of Y/C PWBs.

[2] MECHANICAL PARTS-LIST AND LAYOUT

• Top view

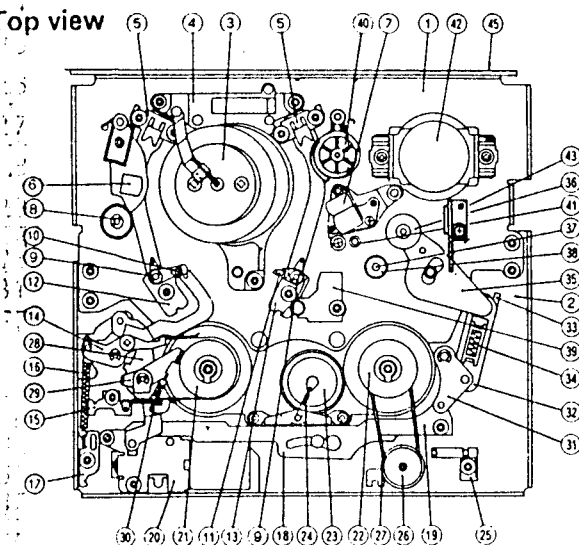


Figure 2.

• Bottom view

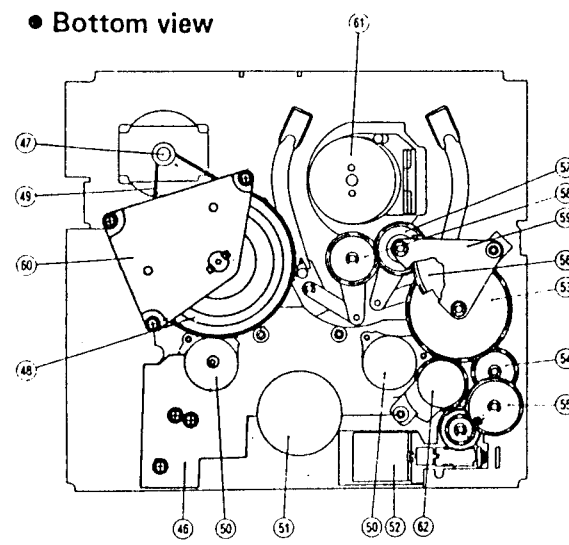


Figure 3.

No.	Description	No.	Description
1	A-chassis	32	Pinch roller double-action lever (Upper)
2	B-chassis	33	Pinch roller double-action lever (Lower)
3	Drum	34	Pinch roller pressure spring
4	V-base	35	Pinch roller lever
5	V-block (Take-up/Supply)	36	Pinch roller
6	Full erase head	37	Capstan shaft
7	Audio/Control head	38	Capstan holder
8	Supply impedance roller	39	Light emitting diode holder
9	Guide roller (Take-up/Supply)	40	_____
10	Supply slant pole	41	Fixed guide
11	Take-up slant pole	42	Capstan motor
12	Pole base A	43	Opening angle
13	Pole base B	44	_____
14	Tension arm	45	Mechanism platform A
15	Tension band assembly	46	Mechanism platform B
16	Tension arm spring	47	Capstan pulley
17	Tension arm spring angle	48	Capstan flywheel
18	Shifter	49	Capstan belt
19	Shifter adjustment	50	Reel brake unit
20	Loading block	51	Reel motor
21	Supply reel disk	52	Loading motor
22	Take-up reel disk	53	Master cam
23	Reel idler	54	Tension arm escape cam
24	Reel idler spring	55	Loading intermediate gear
25	Cassette down switch	56	Segment gear
26	Counter platform pulley	57	Loading gear A
27	Counter belt A	58	Loading gear B
28	Shifter arm	59	Loading gear plate
29	Auxiliary brake	60	Flywheel angle
30	Auxiliary brake spring	61	Drum direct drive motor
31	Pinch roller drive lever	62	Mechanical position switch

[3] ADJUSTMENT, REPLACEMENT, ASSEMBLING AND CLEANING OF MECHANICAL UNITS

Here we will describe a relatively simpler service work in the field, not referring to the more complicated repairs which would require the use of special equipment and tools (drum assembly or

replacement, for example). We are sure that the easy-to-handle tools listed below would be more than handy for periodical maintenance to keep the machine in its original efficient condition.

• **TOOLS NECESSARY FOR ADJUSTING MECHANICAL UNITS**

The following tools are required for proper service and satisfactory repair.

	Jig Item.	Part No.	Configuration	Remarks
1	Master plane and reel disk height adjusting jig.	JiGMA0001		This jig is used for checking and adjusting the relative mechanical heights between reel disk and stay.
2	Guide pole height adjusting jig	JiGGH0110		This jig is used for adjusting the height of the running tape to video head.
3	Torque gauge	JiGTG1200		These jigs are used for checking and adjusting the torque of take up/supply reel.
	Torque gauge	JiGTG0090		
4	Gauge head	JiGTH0006		
5	Tension gauge (300g)	JiGSG0300		There are several gauges used for the tension measurements, and required 300g and 5.0 kg.
	Tension gauge (5.0 kg)	JiGSG5000		
6	Hexagonal wrench (0.9 mm)	JiGHW0009		These jigs are used for locking or tightening special hexagon type screws.
	Hexagonal wrench (1.2 mm)	JiGHW0012		
	Hexagonal wrench (1.5 mm)	JiGHW0015		
7	Alignment tape (PAL)	VROCPSV		This tape is especially used for electrical fine adjustment.
8	Drum replacement jig	JiGDT-0001		This jig is used for the replacement of video cassette recorder's upper drum.
9	Direct drive roter ass'y setting jig	JiGGAST200		This jig is used for the replacement of the direct drive motor.

Use of tools other than those listed will make the repair work lengthy and a matter of trial and error, with the likelihood of unsatisfactory results.

These tools will be required frequently, so be sure to follow the instructions in this manual throughout the repair, adjustment and checking processes.

• PREVENTIVE CHECKS AND SERVICE INTERVALS

The following intervals for checks and servicing should be observed in order to maintain the high quality of mechanical components.

The time elapsed Part Name	500 hours	1,000 hours	1,500 hours	2,000 hours	3,000 hours	Notes
Guide roller ass'y	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Replace in the event of irregularities such as (substantial) rotation or wobbling.
Supply impedance roller	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Supply impedance roller inner.		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	Clean with industrial-grade methyl alcohol.
Supply impedance roller flange A	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Clean those parts in contact with the tape. Use only the specified cleaning liquid.
Supply impedance roller flange B	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Take-up roller	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Stationary guide	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Guide flange B	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Slant pole	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Video head	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Full erase head	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Audio/Control heads	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Clean rubber parts and those parts in contact with rubber. Use only the specified cleaning liquid.
Capstan belt		<input type="checkbox"/>		<input type="checkbox"/>		
Counter belt				<input type="checkbox"/>		
Pinch roller	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Reel idler	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Clean those parts in contact with rubber.
Reel motor pulley	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Reel motor				<input type="checkbox"/>		
Capstan motor				<input type="checkbox"/>		
Loading motor				<input type="checkbox"/>		Clean with industrial-grade methyl alcohol
Supply & Take up reels		<input type="checkbox"/> Δ		<input type="checkbox"/> Δ		
Tension band ass'y					<input type="checkbox"/>	
Brake unit			<input type="checkbox"/>			
Cassette delivery roller	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If there is something abnormal when the cassette is loaded in or out of the cassette compartment, clean the rubber part of the cassette delivery roller, or replace the roller itself with a new one.

○ ... Replace □ ... Clean Δ ... Oil

REMOVAL AND REASSEMBLY OF CASSETTE HOUSING CONTROL ASSEMBLY

- Removal
 - 1) Eject the cassette in the cassette eject mode.
 - 2) Pull off the connector on the right side of the cassette housing. (Note that the lead wire should not be cut off.)
 - 3) Remove two screws fixing the cassette housing.
 - 4) Shift the cassette housing toward arrow (A) in the following figure 4 and take it out right above.

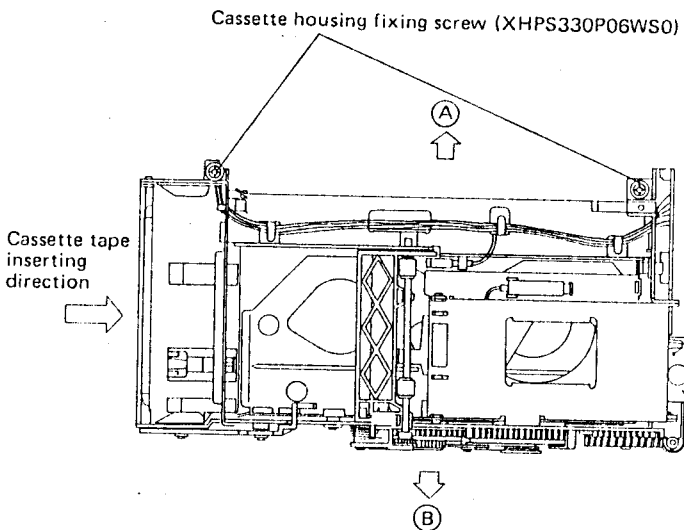


Figure 4.

- Notes:
- 1) Do not touch the guide pin, the supply impedance roller, the drums, and other parts at removal and reassembly of the cassette housing.
 - 2) Do not forget to remove the plug receptacles for the main power source at removal and reassembly.

- Reassembly
 - 1) Connect the connector on the right side of the cassette housing.
 - 2) Insert the hooks of the cassette housing into mechanical chassis B, shift it toward arrow (B), and fix it temporarily.
 - 3) Check if the cassette housing is placed in the right position and fix it with two screws (XHPS330P06WS0).
 - 4) Treat the lead wire for the connector on the right side of the cassette housing.

TO RUN A TAPE WITHOUT CASSETTE TAPE HOUSING CONTROL ASSEMBLY

- 1) Open the cover of video cassette tape manually, fix the cover with a piece of vinyl tape, and use it.

- 2) Set the video cassette tape with the cover open to the mechanical system by putting a weight (500g or less) on the tape to prevent it from lifting for stability running.
Note: The weight should not be more than 500g.

REEL DISK REPLACEMENT AND HEIGHT ADJUSTMENT

- Removal
(Supply reel disk)
 - 1) Remove the tension band (7).
 - 2) Remove the slit washer (1).
 - 3) Remove the clearance adjustment washer (2).
 - 4) Lift the supply reel disk (3) upwards to remove, and replace.
(Take-up reel disk)
 - 1) Remove the counter belt (6).
 - 2) Remove the slit washer (1).
 - 3) Remove the clearance adjustment washer (2).
 - 4) Lift the take-up reel disk (4) upwards to remove, and replace.
* when the height adjustment washers (5) are remove, they should also be cleaned.

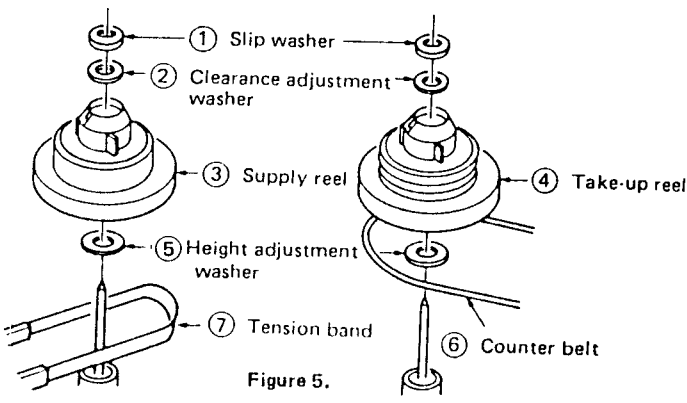


Figure 5.

- Reassembly
(Supply reel disk)
 - 1) Clean the reel disk shaft and fit the height adjustment washer (5).
 - 2) Fit the replacement supply reel disk (3).
 - 3) Adjust the reel height by means of the master plane and the reel height adjustment jig.
 - 4) Remove the replacement supply reel disk (3) and oil the reel shaft and then refit the replacement supply reel disk (3).
 - 5) Fit the clearance adjustment washer (2). (The reel disk thrust play should be 0.1 to 0.5mm).
 - 6) Fit the slit washer (1).
 - 7) Fit the tension band (7).

(Take-up reel disk)

- 1) Clean the reel disk shaft and fit the height adjustment washer (5).
- 2) Fit the replacement take-up reel disk (4).
- 3) Adjust the reel height by means of the master plane and a reel height adjustment jig.
- 4) Remove the replacement take-up reel disk (4) and oil the reel shaft, and then refit the replacement take-up reel disk (4).
- 5) Fit the clearance adjustment washer (2). (The reel disk thrust play should be 0.1 to 0.5mm).
- 6) Fit the slit washer (1).
- 7) Fit the counter belt (6).

Notes:

- 1) Do not scratch the reel mount or shaft with a slit washer or a tool at removal and reassembly.
- 2) Do not transform the tension band or the auxiliary-brake at removal and reassembly.
- 3) Adjust the height of reel mount at reassembly.
- 4) Check and adjust the tension pole position.
- 5) Check back-tension in the video search mode after reassembly.
- 6) Reassemble the reel mount after lightly rotating it manually and fitting it into the catch of the slip board of the reel unit since the reel mount is made to be fitted into the catch.

HEIGHT CHECKING AND ADJUSTMENT

- 1) Remove the cassette housing and set the master plane in the mechanism as shown in figure 6 (a), taking care not to touch the drum.
- 2) Check to see whether part A of the reel disk height adjustment jig in figure (b) is low and part B is high. If they are not within the specified values, adjust the height with the height adjustment washer, so that vertical play is within 0.1 to 0.5mm.

Note:

Always check and adjust the reel disk height when replacing the reel disks.

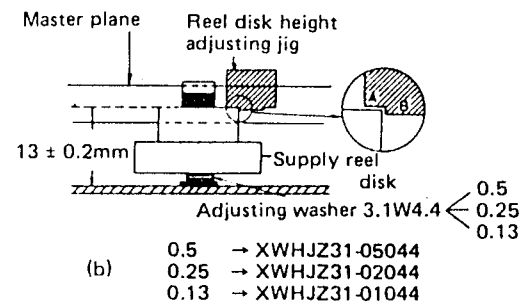
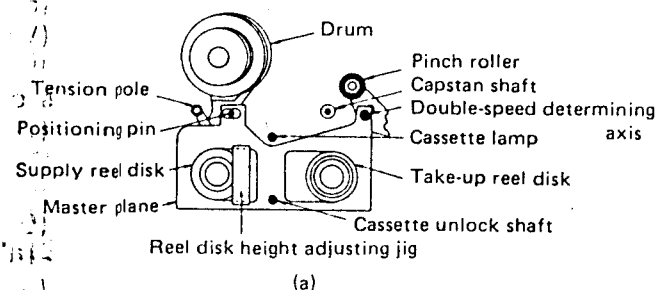


Figure 6.

CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN FAST-FORWARD MODE

Note: Do not scratch the reel mount or shaft with a slit washer or a tool at removal and reassembly.

- 1) When setting the torque gauge on the reel disk and pressing the fast-forward button to start the reel disk turning, take care that the torque gauge does not fly off.
- 2) The checking and adjustment should be carried out without a video cassette tape in place.

• Checking

- 1) Remove the cassette housing, and hold the cassettedown switch down with adhesive tape.
- 2) Set the torque gauge on the take-up reel disk and press the fast-forward button to enter the fast-forward mode.
- 3) Rotate the torque gauge slowly (about one turn in 2 to 3 seconds) by hand in the take-up direction, checking that there is no slippage between the reel idler, reel motor pulley, and the take-up reel disk with a torque of 800g.cm or more.

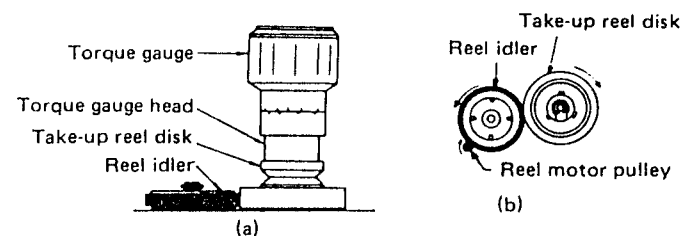


Figure 7.

• Adjustment

If the take-up torque is outside the specified values, clean the reel motor pulley, the reel idler, and the take-up reel disk with cleaning fluid, and re-check.

CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN REWIND MODE**Notes:**

- 1) When setting the torque gauge on the reel disk and pressing the rewind-button to start the reel disk turning, take care that the torque gauge does not fly off.
- 2) The checking and adjustment should be carried out without a video cassette tape in place.

• Checking

- 1) Remove the cassette housing and hold the cassettedown switch down with adhesive tape.
- 2) Set the torque gauge on the supply reel disk and press the rewind-button to enter the rewind mode.
- 3) Rotate the torque gauge slowly (about one turn in 2 to 3 seconds) by hand in the direction of tape take-up, checking that there is no slippage between the reel idler, the reel motor pulley and the supply reel disk with a torque of 800 g.cm or more.

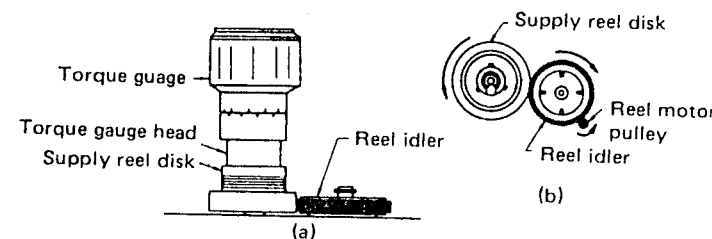


Figure 8.

• Adjustment

Clean the reel motor pulley, the reel idler, and the supply reel disk with cleaning fluid, and re-check if the take-up torque is outside the specified values.

CHECKING OF TAKE-UP TORQUE IN PLAY BACK MODE**• Checking**

- 1) Remove the cassette housing and hold the cassettedown switch down with adhesive tape.
- 2) Set a torque gauge to the take-up reel disk and rotate it in a clockwise direction once for every 9 seconds and check that the torque is within the specified range.

Set value: 170 ± 15 g.cm

Caution:

The take-up torque varies with the revolution torque of the motor and so the average value must be taken for the set value.

• Adjustment

If the Play back take-up torque is not at the set value (170 ± 15 g.cm), adjust it with the adjusting control indicated below.

(Adjusting control)

Deck1: R7012

Deck2: R753

CHECKING OF FAST-FORWARD BACK TENSION**Note:**

Measure after confirming that the torque gauge is securely set on the reel disk. Measurements cannot be performed if the torque gauge floats away from the reel disk.

• Checking

- 1) Remove the cassette housing and hold the cassettedown switch down with adhesive tape.
- 2) Press the fast-forward button to enter the fast forward mode.
- 3) Put the torque gauge on the supply reel disk and slowly rotate it to the right (1 turn every 2 to 3 seconds) and check that the torque is within the specified range (10 g.cm. to 20 g.cm.).

CHECKING OF REWIND BACK-TENSION**Notes:**

- 1) Measure after confirming that the torque gauge is securely set on the reel disk. Measurements cannot be performed if the torque gauge floats away from the reel disk.
- 2) The rewind back-tension is the same as that for the video search rewind mode and therefore need not be checked if the check for the back-tension (in video search rewind mode) has already been performed.

• Checking

- 1) Remove the cassette housing and hold the cassettedown switch down with adhesive tape.
- 2) Press the rewind-button to enter the rewind mode.
- 3) Put the torque gauge on the take-up reel disk and slowly rotate it to the left (1 turn every 2 to 3 seconds) and check that the torque is within the specified range (less than 15 g.cm.).

CHECKING OF BACK-TENSION IN VS-FF MODE

Notes:

- 1) Check and adjust the back-tension (in video search fast-forward mode) after adjusting the position of the tension arm.
- 2) Make the measurement with the torque gauge securely on the supply reel disk. It will not be possible to obtain an accurate reading if the torque gauge is not secure.
- 3) Adjust the auxiliary brake spring and recheck if the back-tension (in video search fast-forward mode) is not within the specified values (15 ~ 25 g.cm.).

• Checking

- 1) Remove the cassette housing.
- 2) Hold the cassettedown switch down with adhesive tape.
- 3) Press the play-button to enter the playback mode.
- 4) Press the video search fast-forward button to enter the video search fast-forward mode and check that the auxiliary brake is acting on the supply reel disk.
- 5) Measure the torque by putting the torque gauge on the supply reel disk and rotating it slowly (1 turn every 2 to 3 seconds), checking that the torque is within the specified values (15 ~ 25 g.cm.).

CHECKING OF BACK-TENSION IN VIDEO SEARCH REVERSE MODE

Note:

Make the measurement with the torque gauge securely on the take-up reel disk. It will not be possible to obtain an accurate reading if the torque gauge is not secure.

• Checking

- 1) Remove the cassette housing.
- 2) Hold the cassettedown switch down with adhesive tape.
- 3) Press the play-button to enter the playback mode.
- 4) Press the video search reverse-button to enter the video search reverse mode.
- 5) Measure the torque by placing the torque gauge on the take-up reel disk and rotating it slowly (1 turn every 2 to 3 seconds), checking that the torque is within the specified values (less than 15 g.cm.).

CHECKING OF PINCH ROLLER ENGAGEMENT FORCE

- 1) Remove the cassette housing and hold the cassettedown switch down with adhesive tape.
- 2) Press the play-button to enter the play mode.
- 3) Pull the pinch roller in the direction opposite to the direction of engagement (arrow (A)) and separate the pinch roller from the capstan.
- 4) Then, gradually return the pinch roller (arrow (B)) and measure the tension when the pinch roller contacts the capstan. Make the measurement when the hall (a) is being pulled only by stick type tension gauge.
- 5) Check that the measure value is within the specified values. (1480 to 1870 g.cm.).

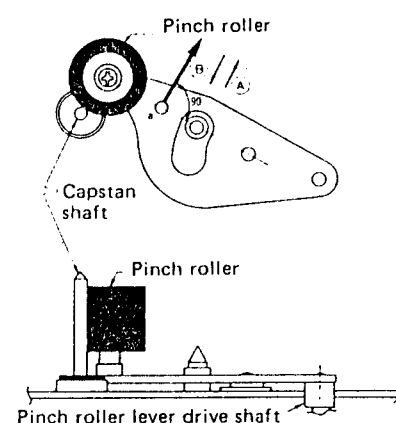


Figure 9.

ADJUSTMENT AND CHECKING OF GAP BETWEEN CAPSTAN AND PINCH ROLLER WITH IN PAUSE IN RECORDING MODE.

• Checking

- 1) Remove the cassette housing.
- 2) Hold the cassettedown switch down with adhesive tape.
- 3) Press the record-button to enter the record mode.
- 4) Press the pause-button to enter the pause mode.
- 5) Visually check that the gap between the pinch roller and capstan in this state is in the specified range (0.7 ~ 1.2 mm).

Note:

Assembly edit is incorporated, so it takes 2 to 3 seconds for the pause mode to be entered.

• Adjustment

- 1) When the space between the pinch roller and capstan shaft does not measure the specified amount, adjust the space by loosening a screw (XBPSD30P05JS0) which attaches the shifter to the shifter adjustment.
- 2) After adjustment, paint the screws (XBPSD30P05JS0) with locking paint.

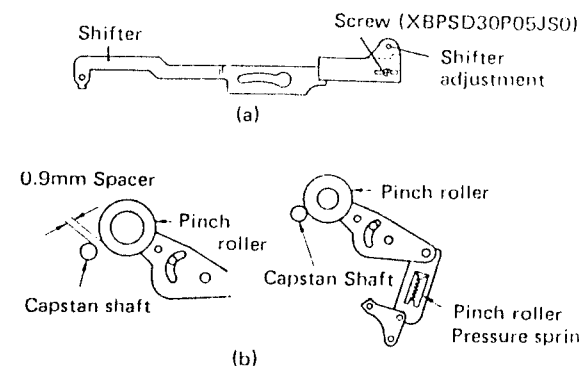
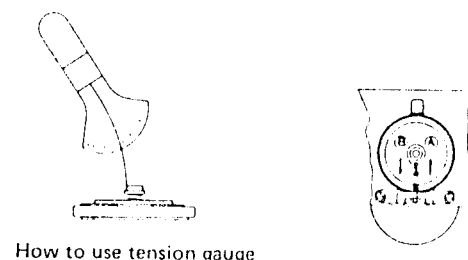


Figure 10.

CHECKING PROCEDURE OF REEL IDLER PRESSURE

- 1) Remove the cassette housing.
- 2) Move the reel idler to the center as shown in figure 11.
- 3) Push the reel idler in the direction of the arrow (A) in figure 11, with the tension gauge, until it separates from the reel motor pulley.
- 4) Gradually return the reel idler in the direction of the arrow (B) in figure 11 and check that the value on the tension gauge at the moment the reel idler contacts the reel motor pulley, is within the specified range (120 to 170 g.).



How to use tension gauge

Figure 11.

CHECKING AND ADJUSTING OF TENSION POLE POSITION

• Position checking

- 1) Remove the cassette housing.
- 2) Load a video cassette and press the play button to enter the play mode.
- 3) At the same time, the pole bases A and B draw the tape from inside the cassette, the tension pole moves to the left, and loading begins. Check the position of the tension pole in this state.
- 4) Visually check that towards the end of the tape (E-180) enter of the tension pole is positioned 1.25 to 1.75 mm to the left of the center of the supply impedance roller.
- 5) Check to see that the video tape is not curling or riding up onto the supply impedance roller flange.
- 6) Check that the tension band is disengaged from the reel disk in video search.

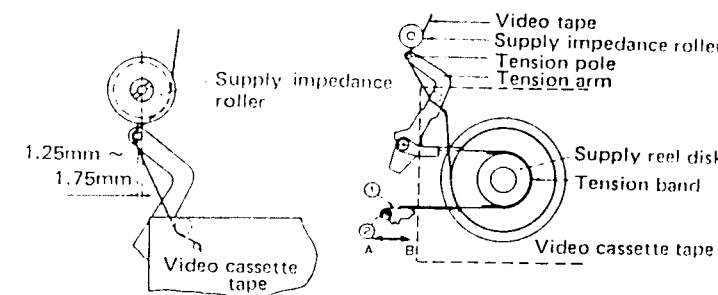


Figure 12.

Figure 13.

• Position adjustment

- 1) When the position of the tension pole is less than 1.25 mm to the left of the center of the supply impedance roller, move the tension band adjustment angle (1) in the direction of the arrow (B) in figure 13 and tighten the screw.
- 2) Where the position of the tension pole is more than 1 mm to the left of the center of the SI roller, move the tension band adjustment angle (1) in the direction of the arrow (A) in figure 13 and tighten the screw.

Notes:

- 1) After adjustment, secure the screws with locking paint.
- 2) Do not overtighten the screws as this may damage the screw mounds on the chassis.

CHECKING AND ADJUSTING OF TENSION POLE VERTICALITY

• Checking verticality

- 1) Remove the cassette housing and hold the cassettedown switch down with adhesive tape.
- 2) Set the stationary guide pole height adjustment jig as shown in figure 14.
- 3) Check the verticality of the tension pole in this state.

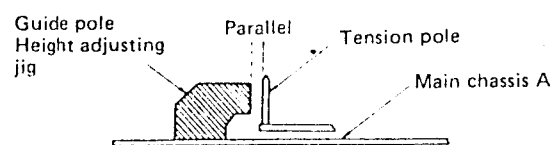


Figure 14.

CHECKING AND ADJUSTING OF BACK TENSION DURING RECORD AND PLAY

• Checking

- 1) Remove the cassette housing and hold the cassettedown switch down with adhesive tape.
- 2) Load the back tension measurement cassette.
- 3) Press the play button to enter the play mode. Check on the indicator needle of the back tension measurement cassette that the back tension is within the set values (50 to 57 g.cm.).
- 4) Check that the video tape is wound round the stationary guide.
- 5) Check that no tape slack is produced and no damage is caused to the edges of the tape, from the beginning to the end of the tape.

• Adjustment

- 1) Shift the tension arm spring angle ① toward arrow (A) in figure 15 and tighten it with screw ② (LX-HZ3012GEFD), when tape tension is less than the set value (50g to 57g. cm).
- 2) Shift the tension arm spring angle ① toward arrow (B) in figure 15 and tighten it with screw ② (LX-HZ3012GEFD), when tape tension is stronger than the set value (50g to 57g. cm).

Notes:

- 1) Apply the screw—lock to screw ② (LX-HZ3012GEFD) after confirming adjustment.
- 2) Do not tighten screw ② (LX-HZ3012GEFD) harder than it needs. The screw thread of the chassis would be crushed if the screw is tightend too hard.

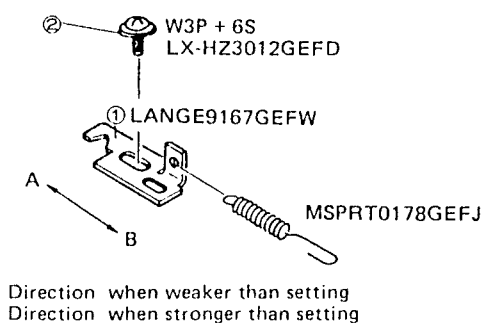


Figure 15.

CHECKING OF REEL BRAKE TORUQE

1. Checking supply side medium braking

Notes:

- 1) Check medium braking before checking strong braking.
- 2) Measure within 10 seconds after plugging in the power cord, and return shorted parts.
- 3) Check the supply side medium braking torque in both the clockwise and counter-clockwise directions of rotation.
- 4) The set value for the supply side medium braking torque is at least 100 g.cm and at most 1/2 of the take-up side strong braking torque.

• Checking

- 1) Remove the cassette housing.
- 2) Unplug the power cord and make shortcircuits on the system control circuit board, as follows. In the case of deck-(1), connect R8041 (the end closer Q801) to ground. In the case of deck-(2), connect R832 (the end closer Q837) to ground.
- 3) Separate the reel idler from the supply reel disk and set the torque gauge.
- 4) Plug in the power cord.
- 5) Slowly rotate the torque gauge (one turn every 2 to 3 seconds) and check that the supply side medium brake torque is at least 100 g.cm.

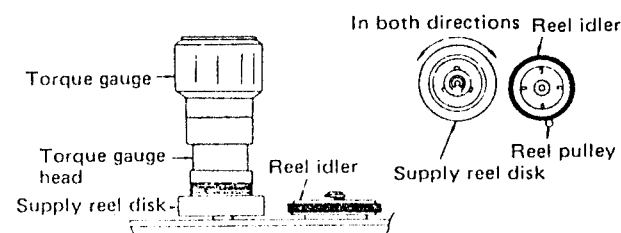


Figure 16.

2. Checking take-up side medium braking

Notes:

- 1) Check medium braking before checking strong braking.
- 2) Measure within 10 seconds after plugging in the power cord, and return shorted parts.
- 3) Check the take-up side medium braking torque in both the clockwise and counter-clockwise direction of rotation.
- 4) The set value of the take-up side medium braking torque is at least 100 g.cm. and at most 1/2 of the supply side strong braking torque.

• Checking

- 1) Remove the cassette housing.
- 2) Unplug the power cord and make shortcircuits on the system control circuit board, as follows. In the case of deck-(1), connect R8042 (the end closer Q8034) to ground. In the case of deck-(2), connect R833 (the end closer Q837) to ground.
- 3) Separate the reel idler from the take-up reel disk and set the torque gauge.
- 4) Plug in the power cord.
- 5) Slowly rotate the torque gauge (one turn every 2 to 3 seconds) and check that take-up side medium brake torque is at least 100 g.cm.

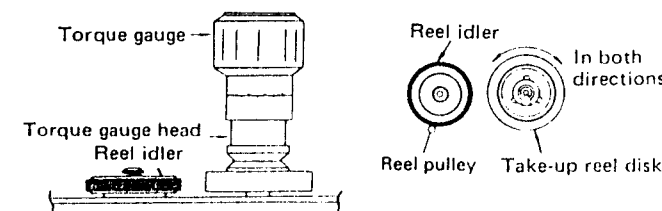


Figure 17.

3. Checking supply side strong braking

Notes:

- 1) Measure within 10 seconds after plugging the power cord, and return the shorted parts.
- 2) Measure the strong braking after measuring the medium braking.

• Checking

- 1) Remove the cassette housing.
- 2) Unplug the power cord and make shortcircuits on the system control circuit board, as follows. In the case of deck-(1), connect R8041 (the end closer A1 connector) to ground. In the case of deck-(2), connect R832 (the end closer D825) to ground.
- 3) Separate the reel idler from the supply reel disk, and set the torque gauge.
- 4) Plug in the power cord.
- 5) Slowly rotate the torque gauge in the clockwise direction (one turn every 2 to 3 seconds), and check that the supply side

strong braking torque is at least 300 g.cm. and that it is at least twice the take-up side medium braking torque.

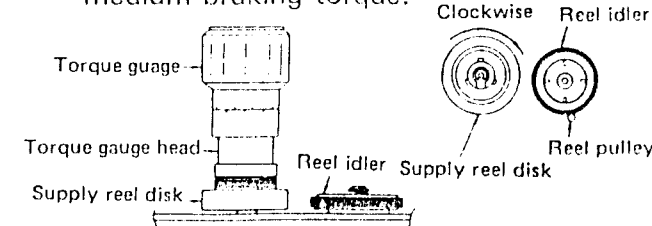


Figure 18.

4. Checking take-up side strong braking

Notes:

- 1) Measure within 10 seconds after plugging the power cord, and return the shorted parts.
- 2) Measure the strong braking after measuring the medium braking.

• Checking

- 1) Remove the cassette housing.
- 2) Unplug the power cord and make shortcircuits on the system control circuit board, as follows. In the case of deck-(1), connect R8042 (the end closer A1 connector) to ground. In the case of deck-(2), connect R832 (the end closer D825) to ground.
- 3) Separate the reel idler from the take-up reel disk, and set the torque gauge.
- 4) Plug in the power cord.
- 5) Slowly rotate the torque gauge in the counterclockwise direction (one turn every 2 to 3 seconds), and check that the take-up side strong braking torque is at least 300 g.cm. and that it is at least twice the supply side medium braking torque.

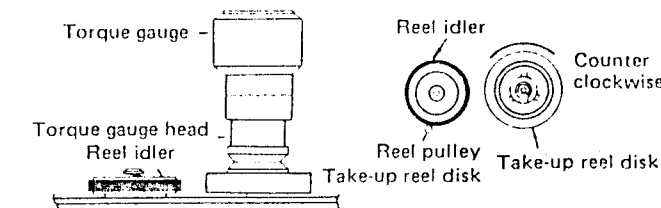


Figure 19.

CHECKING AND ADJUSTMENT OF SUPPLY IMPEDANCE ROLLER/STATIONARY GUIDE HEIGHT

• Checking

- 1) Check that the edge of the video tape does not fold or crease, as shown in figure 20, during the travel of the tape:

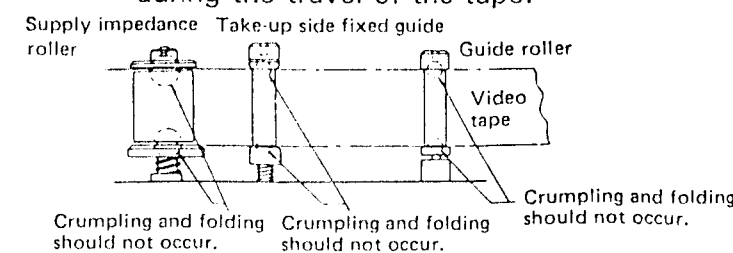


Figure 20.

• Adjustment

The following adjustments should only be made where misalignment has been positively identified.

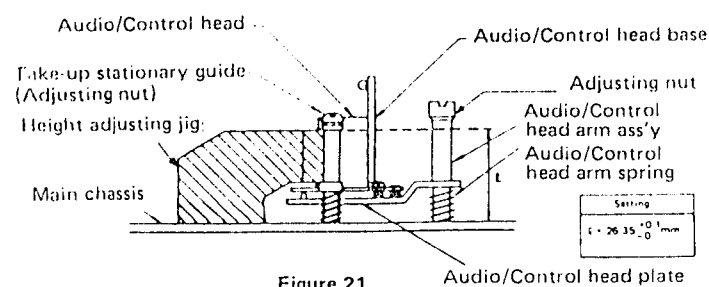


Figure 21.

- 1) Set the guide pole height adjustment jig on the main chassis A, as shown in figure 21.
- 2) Slowly turn the nuts of the stationary guide and the upper portion of the supply impedance roller with a flatbladed screwdriver, and adjust the height to $l = 26.35 \pm 0.1$ mm).

Notes:

- 1) After adjustment, check the result by running a video tape.
- 2) After adjustment is complete, always adjust the tape travel, and adjust the take-up and supply guide rollers before carrying out the checks in figure 20.
 - Do not move the nuts once the adjustment has been completed.

REPLACEMENT OF AUDIO/CONTROL HEAD

Notes:

- 1) After completing the replacement, always check the tape travel path adjustment. When replacing the heads, never touch the head surface.
- 2) The peaking coil (VP-DF150K0000), which is fitted between NF (6) pin of the deck-(2) side audio/control head PWB and R8007, should be made parallel to the audio/control head PWB and at a right angle to the chassis A when reassembling after replacing the audio/control ass'y.

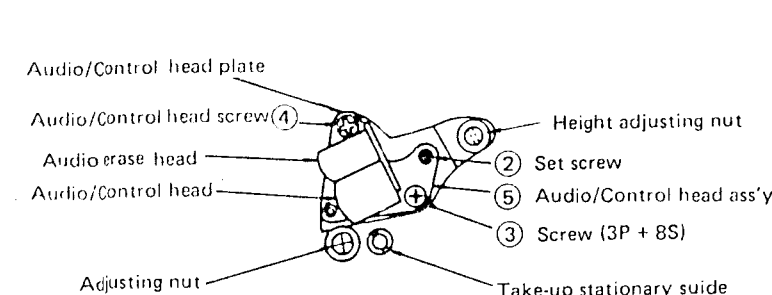


Figure 22.

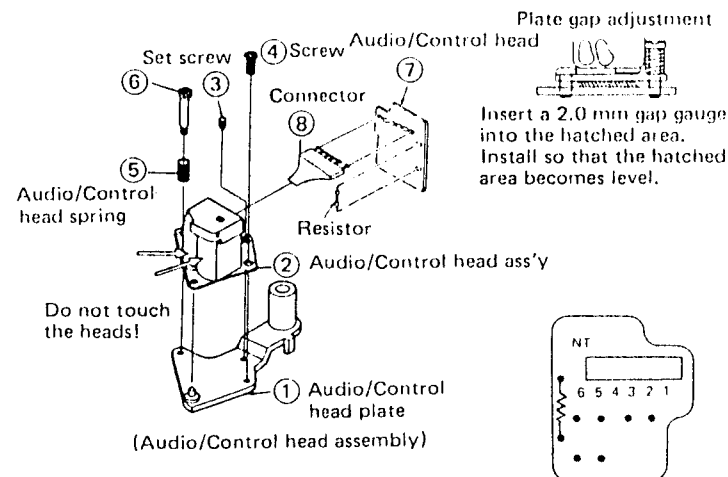


Figure 23.

• Replacement

- 1) Unsolder the leads joined to the audio/control head board and remove the leads from the board.
- 2) Undo the setscrews (2) with a hexagonal wrench.
- 3) Remove the screw (3) (3P + 8S) with a Philips screwdriver.
- 4) Undo the audio/control head screw with a Philips screwdriver. Care is needed at this stage as there is a spring inserted between the plate and the audio/control head screw (4).
- 5) Remove and replace the audio/control head board affixed to the audio/control head assembly.
- 6) It is best to replace the whole entire head when exchanging the audio/control head ass'y (5).

AUDIO/CONTROL HEAD HEIGHT AND TILT CHECKING AND ADJUSTMENT

• Checking

- 1) Select the play mode with a 180 minute tape loaded.
- 2) Check that the tape is not curling on the flanges of the take-up station.
- 3) Check that the audio/control head has a height and tilt with regard to the tape as shown in figure 24.

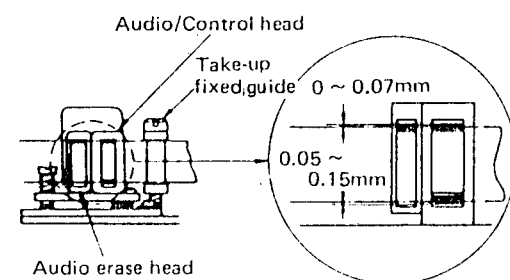


Figure 24.

• Adjustment

1. Carry out the following adjustments with reference to figures 22 and 24, if an abnormality can be seen in the travel mode.

- 1) Put the machine into the play mode with a 180 minute tape, to check the travel.
- 2) Check that the tape moves cleanly and smoothly, and remains completely flat as it travels from the guide roller to the take-up impedance roller, from the take-up impedance roller to the take-up stationary guide, and from the take-up stationary guide to the capstan shaft.
- 3) If the tape is slightly misaligned between the audio/control head and the take-up stationary guide it will be absolutely impossible to achieve a satisfactory picture, so check that the tape does not ride up on the flanges of the take-up stationary guide producing small creases.
- 4) If adjustment is needed, adjust by means of the setscrews (2) in figure 22). Turn the screw (2) slightly.
N.B. Do not move the take-up stationary guide.
- 5) The height of the audio/control head should be positioned with regard to the tape as shown in figure 25.

2. Once tape travels smoothly around the audio/control head, and the height has been roughly adjusted, next use an alignment tape for fine head height and azimuth adjustment.

- 1) Play the 1 kHz audio signal on the alignment tape (the video image will be color bars), and measure the audio board, on an oscilloscope.
- 2) Turn the setscrew (2) and the screw (3) slightly to achieve the maximum level, and at the same time, adjust for the minimum level variation.
- 3) Reproduce the 7 kHz audio signal on the alignment tape (the video is a stepped wave), and measure the audio board, on an oscilloscope.
- 4) Adjust the azimuth adjustment screw (3) (3P + 8S) for the maximum audio level.
- 5) Recheck the tape travel adjustment.

ADJUSTMENT OF TAPE TRAVEL

- 1) Adjust and check the height of the reel disks with the master plane and the reel height adjustment jig.
- 2) Check and adjust the height of the supply impedance rollers and the stationary guides, using the stationary guide height adjustment jig.
- 3) Check the position and verticality of the tension of the tension poles, using a tension pole position adjustment jig.

- 4) Set a rough adjustment tape in play, and carry out rough adjustment of the height of the guide rollers with a flat-bladed screwdriver, so the lower edge of the tape lies along the drum's lead.

Also, check that the video tape does not curl on the flanges of the take-up and supply guide rollers.

- 5) Play a standard tape and finely adjust the height of the guide rollers so that the envelope is flat, and is not excessively adversely affected even when the tracking knobs are rotated. Also, adjust the switching point to $6.5H \pm 0.5H$.
- 6) Adjust the height, tilt and azimuth of the audio/control head.
- 7) Turn the tracking knob to its preset position and turn the adjusting nut (in figure 22) so that the envelope is at a maximum before performing adjustment of the audio/control head.
- 8) Make a recording on a standard tape to check the flatness of the envelope and sound reproduction.
- 9) After adjustment, all the adjusting screws and nuts, etc., should be secured in place by a coating of locking paint.

REPLACEMENT OF UPPER DRUM

Caution:

The fit of the external surface of the disk with the internal surface of the upper drum is in the order of a few microns and so fitting will be difficult to perform if there are any scratches or dirt specks present and there is a possibility that there will be an influence upon the accuracy of fitting. Extra caution should therefore be paid when replacing.

• Replacement

- 1) Use a Philips-head screwdriver to remove the two brass (3P + 4S) fixing screws (6).
- 2) Remove the video head: lead shield cap (7).
- 3) Remove the lead wires when removing the solder from leads (1) - (4).
- 4) Use a Philips-head screwdriver to remove the two flat brass (W3P + 9S) washer screws.
- 5) Remove the upper drum by lifting straight up so that it does not incline and perform replacement without damaging the outer surface of the disk.

Cautions:

- 1) Do not touch the surface of the drum.
- 2) Insert the screwdriver and tighten the screw gently.

• Assembly

- 1) Fit a replacement drum as shown in figure 25, taking care to correctly position the respective leads.

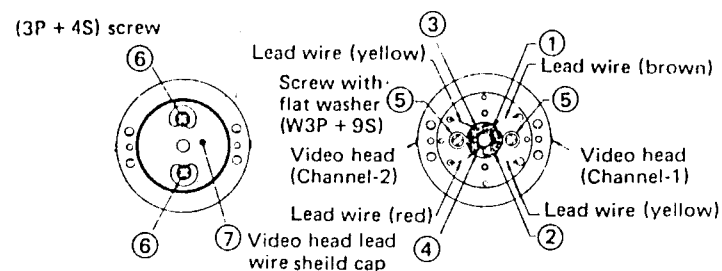


Figure 25.

Notes:

- 1) Before setting, check that there are no scratches or dirt on the edges or outer surface of the disk.
- 2) Before setting, check that there are no scratches or dirt on the edges or inner surface of the upper drum.
- 3) When setting, insert the upper drum slowly so that it does not incline towards the disk.
- 4) When setting, take care to prevent dust and rubbish entering between the disk and the upper drum.
- 5) Insert the screwdriver and tighten the screw gently.
 1. Fix the upper drum with the two screws (5).
 2. Solder the leads (1) - (4) in their specified position.
 3. Fix the video head lead wire shield cup (7) with screw (6). Tighten the screw gently.
 4. When the replacement is complete, check the tape travel and then make an electrical test.

- (1) Adjust the playback switching point.
- (2) Adjust the recording switching point.
- (3) Check the tracking preset.
- (4) Check the tracking volume.
- (5) Check the head resonance and playback pre-amplifier adjustment.
- (6) Check the frequency modulation channel balance.

Note:

Carry out the soldering in a short time and do not contact the adjacent pattern.

ADJUSTMENT OF GUIDE ROLLER

• Video tape setting

- 1) Remove the upper cabinet.
- 2) Place an alignment cassette into the cassette housing.
- 3) Properly connect the power cord, monitor output cord and video input cord.

- 4) Connect channel-1 of the oscilloscope to the radio frequency envelope output terminal and:
- In the case of deck-(1), connect TP3305 and channel-2 of the oscilloscope to switching pulse terminal TP3304.

In the case of deck-(2), connect TP305 and channel-2 of the oscilloscope to switching pulse terminal TP303.

- 5) Press the play button to enter the play mode.

• Adjustment

- 1) The guide roller setscrews should be sufficiently tightened with a using the guide roller adjustment flat bladed screwdriver.
- 2) Trigger with a switching pulse and observe the envelope (figure 26).
- 3) Adjust the height of the guide rollers while watching the envelope, so that the tape runs along the drum lead. Whether the video tape is above or below the helical lead will be shown in the waveform represented by the envelopes in figures 27 and 28 respectively.

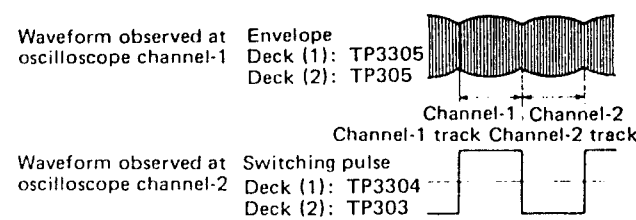


Figure 26.

- a. Envelope waveforms where video tape is floating below the helical head position.

Tape-helical lead distance	Slight	Greater	Extreme
Supply side (Drum inlet)			
Take-up side (Drum outlet)			

Figure 27.

- b. Envelope waveforms where the video tape is too heavily suppressed to the helical lead position.

Tape-helical lead distance	Slight	Greater	Extreme
Supply side (Drum inlet)			
Take-up side (Drum outlet)			

Figure 28.

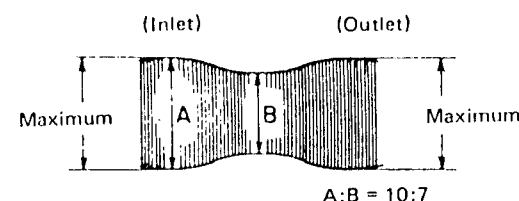


Figure 29.

- 4) Fine adjust the height of the guide roller while watching the envelope, to make the envelope flat. Adjust so that even altering the tracking controls has little ill effect on the flatness.
- 5) Adjust so that when the tracking control is moved from its normal position (the tracking control is moved and A of the radio frequency waveform begins to decline) the ratio between A and B in figure 29 is better than A(10):B(7).
- 6) Perform adjustment of the playback switching point along with that for the playback switching point adjustment for electrical adjustment.
- 7) Record and play a colour bar with a video tape to check that the envelope is flat.
- 8) After adjustment, the guide roller setscrews should be finally tightened.
- 9) After doing this, check the radio frequency envelope again.

REPLACEMENT OF REEL UNIT

1. Reel motor replacement

• Removal

- 1) Remove the cassette housing.
- 2) Unsolder the leads on the reel motor terminals of relay base plate B.
- 3) While supporting the reel motor from the rear of the chassis, remove the two screws (XBPSD30P07J00) (2) that retain the reel motor, and remove the motor. At this time, the reel idler (4) should be moved to the right or left to prevent it from falling out.

Notes:

- 1) Take care not to mistake the polarity when soldering the reel motor.
- 2) Use only specified screws for mounting the reel motor. If other screws are used, the motor may be damaged.
- 3) When fitting the reel motor, take care that the lead wires do not bite into the reel chassis or relay base plate B.

• Fitting

- 1) Check that the reel idler (4) has not moved off the reel chassis (1), and that the reel idler spring (5) is properly attached to the reel idler.
- 2) Taking care not to damage the reel motor pulley (3), install a replacement reel motor with two screws (XBPSD30P07J00) such that the reel motor leads run in the directions shown in figure 30 (use of longer screws will damage the motor).
- 3) Solder the leads to the terminals of relay base plate B.
- 4) Clean the reel motor pulley, reel idler, supply reel and take-up reel with the designated cleaning fluid.
- 5) Check the fast forward and rewind take-up torque, and check and adjust the playback take-up torque as described on P.9.

2. Reel idler replacement

Note:

The reel idler can be replaced without unsoldering the reel motor leads (step 2) of "Removal" in 1) above may be omitted). Care must however be taken not to break the reel motor leads, nor to damage the reel motor, reel motor pulley and other parts by hitting them against each other.

• Removal

- 1) Remove the reel motor as described in (steps 1) - 3) of "Removal" in 1) above.
- 2) Move the reel idler to the center of the reel chassis as shown in figure 30, and then pull slightly to the reel motor side to remove the reel idler.

Notes:

- 1) Take care not to deform the reel idler spring.
- 2) If the reel motor leads are not disconnected for the replacement operation, (step 3) of "Fitting" in 1) above may be omitted.
- 3) Even when only the reel idler is replaced, always check the take-up torques as described in (step 6) or "Fitting" in 1) above.

• Fitting

- 1) Hook the reel idler spring correctly on the idler, and assemble by fitting the reel idler onto the reel chassis.
- 2) Move the reel idler to the left or right.
- 3) Fit the reel motor as described in steps 1) — 5) of "Fitting" in 1) above.

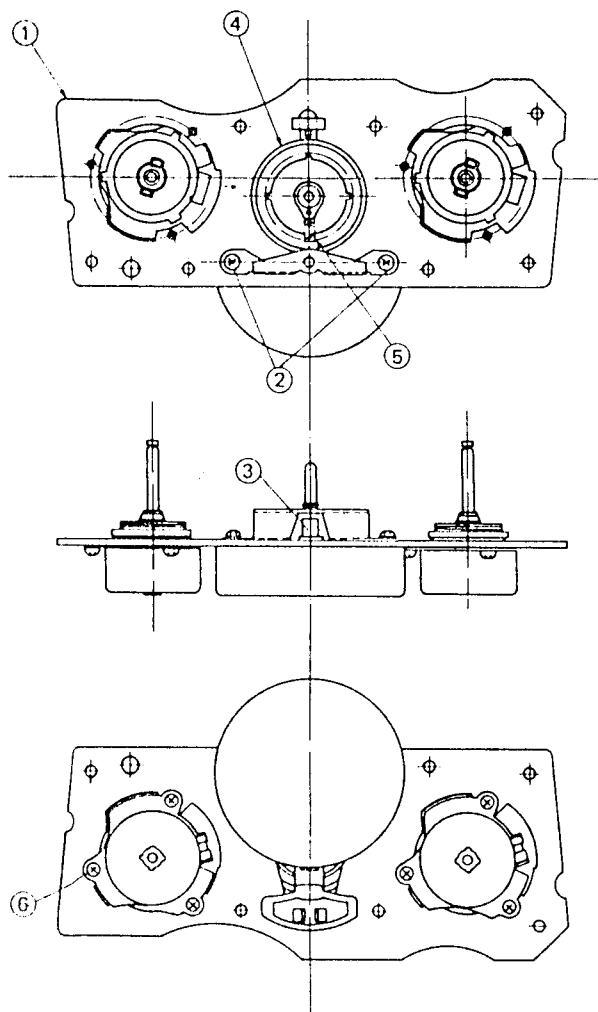


Figure 30.

3. Brake unit replacement

Notes:

- 1) After replacing a brake unit, always check the reel height, the video-search back tension and the fast-forward back tension.
- 2) The brake unit can be replaced without unsoldering the lead wires on relay base plate B (step 3) of "Removal" may be omitted). Take due care, however, not to break the lead wires or damage other parts.

- 3) When fitting or removing the reels, take care with regard to the notes on P.7.
- 4) Use no screws for fitting the brake unit other than those specified.

• Removal (remove the units on both the supply and take-up sides by the following procedure)

- 1) Remove the reel as described on P.7.
- 2) Unsolder the brake unit terminals, both supply side and take-up side, on relay base plate B at the rear of the chassis.
- 3) Unsolder the mechanism position switch, loading motor, reel motor and cassettedown switch lead wires on relay base plate B.
- 4) Remove the two fixing screws (XHPSD30P-12WS0), and fixing screw (XHPSD30P-14WS0) on relay base plate B, and remove relay base plate B.
- 5) Remove the three fixing screws (XBPSD-26P04000) (6) on the brake unit, and remove the brake unit.

Notes:

- 1) Do not mistake the polarities of the mechanism position switch, loading motor and reel motor terminals.
- 2) Solder the brake unit terminals after fixing the relay base plate with screws.
- 3) If the replacement operation is carried out without unsoldering the mechanism position switch, loading motor, reel motor and cassettedown switch leads, step 3) of "Fitting" may be omitted.

• Fitting

- 1) Fit the replacement brake unit, facing the way shown in figure 30, by means of the three fixing screws (XBPSD26P04000).
- 2) Fit the relay base plate B with the two fixing screws (XHPSD30P12WS0), and fixing screw (XHPSD30P14WS0).
- 3) Solder the mechanism position switch, loading motor, reel motor and cassettedown switch leads.
- 4) Solder the brake unit terminals.
- 5) Fit the reel as described on P.7.
- 6) Carry out the checks described on P.7, and check the back tension as described on P.10 (when replacing the supply side brake unit only).

REPLACEMENT OF CAPSTAN MOTOR

• Removal

- 1) Remove the capstan belt.
- 2) Remove the solder on the (two) motor leads from the mechanism circuit board A.
- 3) Remove the two cup tight screws (XHPSD30P06WS0) and remove the capstan motor holder from chassis A.
- 4) Remove the three screws (XBPSD20P05J00) and remove the capstan motor from the capstan motor holder.

• Fitting

- 1) Fit the capstan motor to the capstan motor holder by means of the three fixing screws (XBPSD20P05J00).
- 2) Fit the capstan motor ass'y on the chassis A with two cup tight screws (XHPSD30P06WS0).
- 3) Solder the motor leads to the mechanism relay base plate.
- 4) After cleaning the capstan belt, capstan pulley and capstan flywheel, fit the capstan belt.

Notes:

1. After fitting, be sure to operate the capstan motor to check there are no irregularities in the belt travel or between the motor and pulley.
2. Check and adjust the servo circuit at the same time.
3. Use only the specified screws for mounting. If other screws are used, the motor may be damaged.

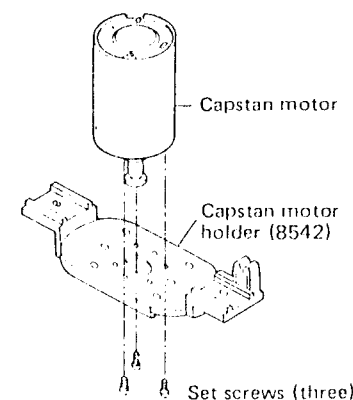


Figure 31.

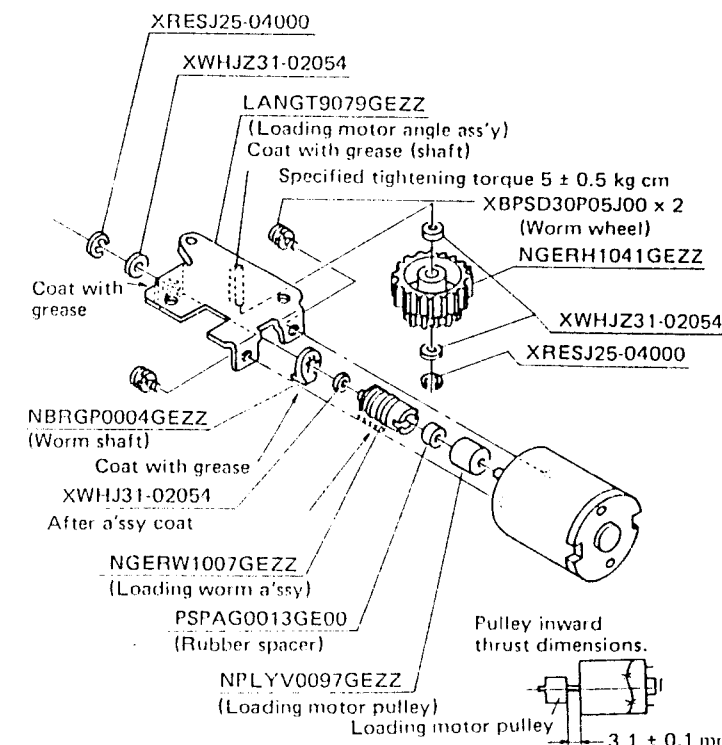
REPLACEMENT OF LOADING MOTOR

• Replacement

1. Unsolder the leads.
2. Remove the two loading motor angle bracket screws (XHPSD30P06WS0), and remove the loading motor angle bracket.
3. Remove the E-ring (XRESJ25-04000) and, after removing the worm wheel, remove the two screws (XBPSD30P05J00) and remove the loading motor.
4. Replace the loading motor for each pulley.

Notes:

1. Check that the spacing between the motor and the loading motor pulley is 3.1 ± 0.1 mm.
2. After fitting, operate the loading motor to check there are no abnormalities in running.



Note: Dampen the rubber with rubber cleaner to make insertion of the rubber spacer easier. (Oil-based greases, etc. must not be used.)

Figure 32.

REPLACEMENT OF DIRECT DRIVE MOTOR

• Removal

- 1) Use a Philips-heads screwdriver to remove the two (SW3P + 5S) screw fixing the direct drive rotor assembly.
- 2) Remove the direct drive rotor assembly by pulling straight along the direction of the axis.
- 3) Use a Philips-head screwdriver to remove the three brass (2P + 12S) screwdrivers fixing the stator assembly.
- 4) Remove the direct drive stator assembly by pulling straight along the direction of the axis.

• Fitting

- 1) Place the direct drive stator assembly on the bearing holder.

(Caution)

Do this so as not to cause any change to the direct drive shield plate or the direct drive shields.

- 2) Fit the direct drive stator using the two brass (2P + 12S) screws.

(Caution)

Do this so as not to disturb the core, winding, and the whole element.

- 3) Insert the direct drive rotor assembly on the drive shaft.

(Caution)

Push directly along the axis.

- 4) Fix the direct drive rotor assembly with the (SW3P + 5S) screws.
- 5) Remove the rotor, insert a spacer and replace the rotor when the space between the end of the rotor and the stator is less than 1.6 mm.
- 6) Do not contact the shaft when locking the (SW3P + 5S) screws.

(Caution)

Confirm that there is not damage to the upper drum or the video head.

Notes:

- 1) Take care not to damage the upper drum and video heads.
- 2) Handle the tools with care while working on the direct drive motor.
- 3) Do not let tools or the direct drive rotor assembly etc., contact or hit the Hall elements.

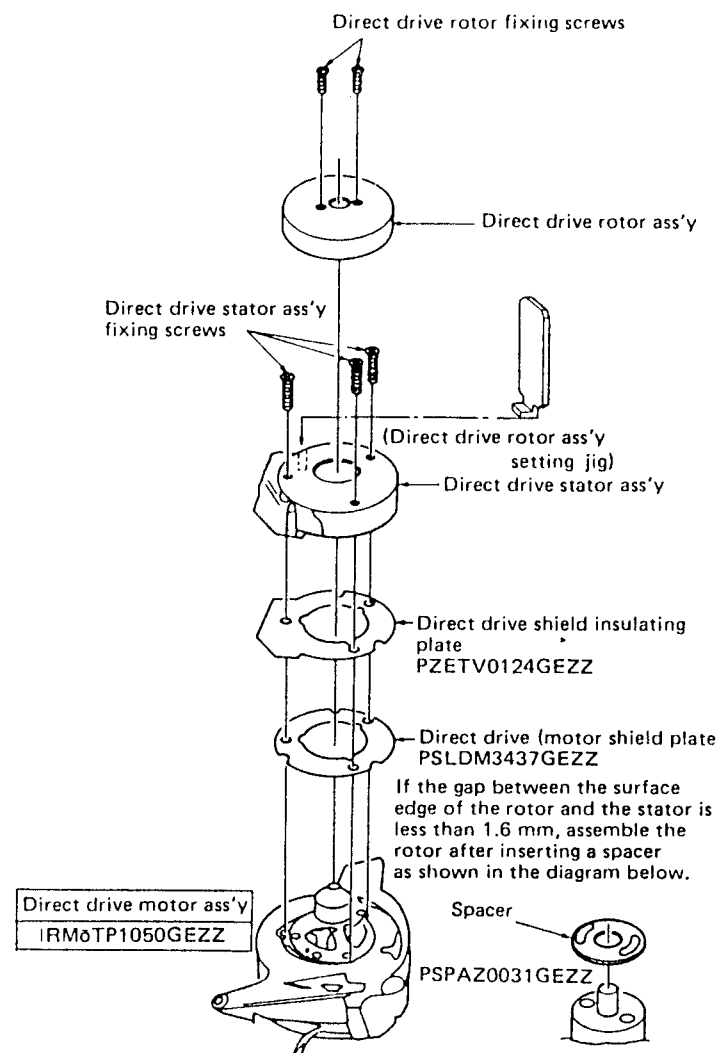


Figure 33.

[4] ADJUSTMENTS OF ELECTRICAL CIRCUIT

ADJUSTMENT OF Y/C RECORDING CIRCUIT

• Test point layout (Deck—1)

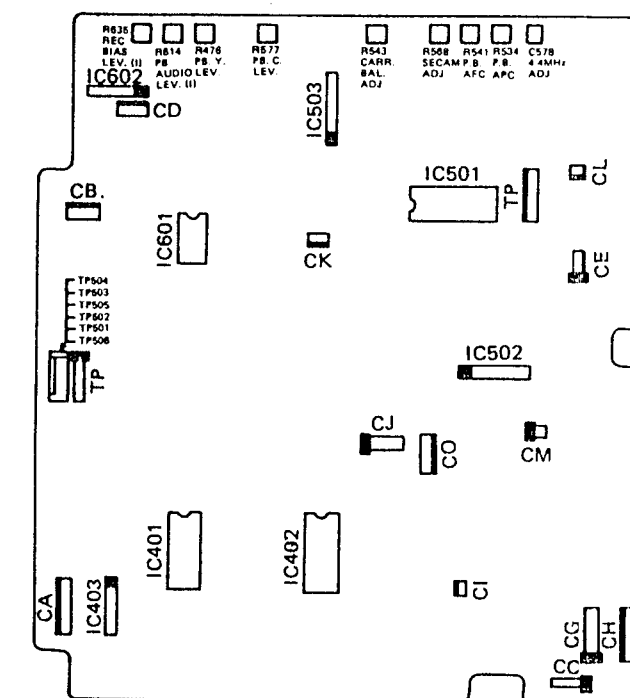


Figure 34.

• Test point layout (Deck—2)

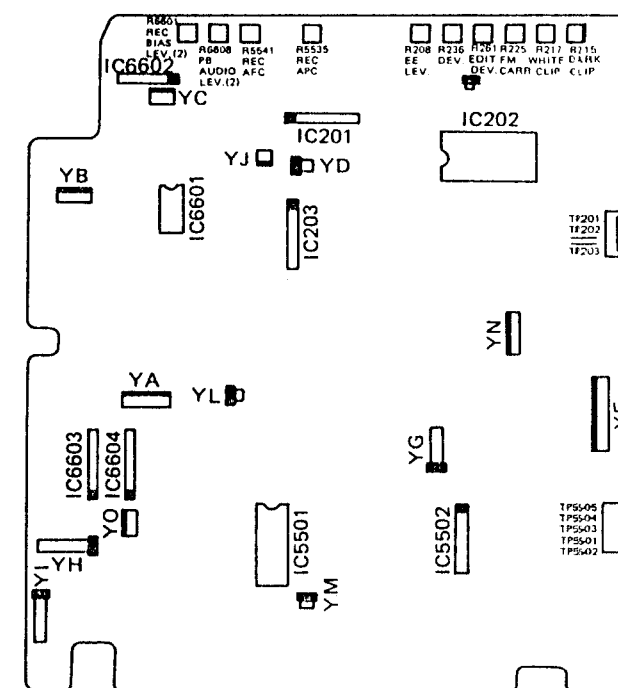


Figure 35.

• E—E level adjustment

- 1) Set deck-(1) or (2) to the recording mode.
- 2) Input the PAL colour-bar signal to video input terminal (input level 1V p-p) and connect the oscilloscope to the video output terminal.
Note: Be sure to connect a 75 ohm (resistor) between video output terminal and ground.
- 3) Adjust R208 (E—E level control) to set the input level to 1V p-p as shown in figure 36.

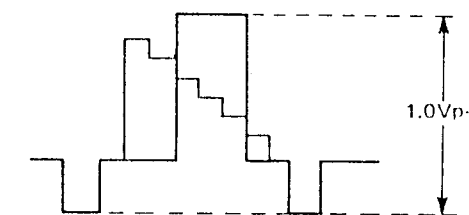


Figure 36.

• FM Carrier frequency and deviation adjustment

This adjustment should be performed only when IC202 is replaced or the carrier-frequency deviates apparently.

- 1) Set deck-(1) or (2) to the recording mode.
- 2) Set the input select switch to the auxiliaries mode and inhibit any signal input to the video input terminal.
- 3) Connect the frequency counter to TP203.
- 4) Adjust R225 (FM frequency control) to make the counter indicates 3.85 MHz.
- 5) Connect the stabilized power supply and the oscilloscope to pin (16) of IC202.
- 6) Adjust the stabilized power supply and read the direct current voltages at pin (16) of IC202 when the counter which is connected in Step 3) indicates 4.8 MHz.
- 7) Remove the stabilized power supply and input the PAL colour-bar signal to video input terminal.
- 8) Adjust R236 (deviation control) to make the white peak of signal at pin (16) of IC202 have the direct current voltages read in step 6).
- 9) After completion of adjustment, remove the connected counter, oscilloscope, and stabilized power supply.

Note:

Prior to the adjustments described in the previous paragraph, take care not to be clipped by adjusting the R215 (dark clip control) and R217 (white clip control).

• White/Dark clip adjustment

- 1) Set deck-(1) or (2) to the recording mode.
- 2) Input the PAL colour-bar signal to the video input terminal and connect the oscilloscope to TP201.
- 3) Adjust the clip points by using R215 (dark clip control) and R217 (white clip control) as set in figure 37.

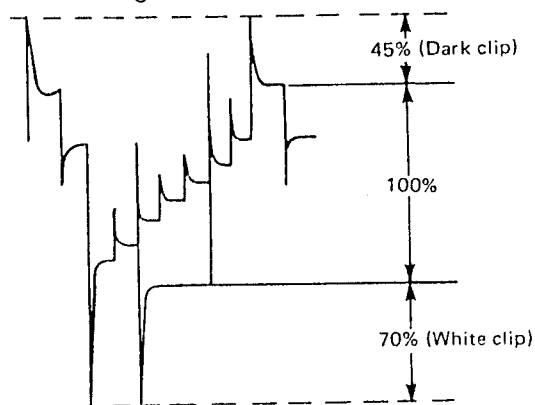


Figure 37.

• AFC adjustment in record mode

- 1) Set deck-(1) or (2) to the recording mode.
- 2) Input the PAL colour-bar signal to the video input terminal.
- 3) Connect the frequency counter between TP5505 and TP5502 (ground).
- 4) Connect a 330 ohm resistor between TP5503 and TP5504.
- 5) Adjust R5504 (AFC adjustment in record mode) as the frequency counter indicates 625 KHz.
- 6) Remove the connected 330 ohm (resistor) and frequency counter after completion of adjustment.

• APC adjustment in record mode

- 1) Stop deck-(1) or (2).
- 2) Connect the frequency counter between TP5501 and TP5502 (ground).
- 3) Adjust R5535 (APC control in record mode) as the frequency counter indicates 4.433619 MHz.

ADJUSTMENT OF Y/C PLAYBACK CIRCUIT

• AFC adjustment in playback mode

- 1) Playback the alignment tape (PAL colour bar signal) by using deck-(1) or (2).
- 2) Connect the frequency counter between TP505 and TP502 (ground).
- 3) Connect TP506 and TP504.
- 4) Connect a 330 ohm (resistor) between TP504 and TP503.
- 5) Adjust R541 (AFC adjustment in playback mode) as the counter indicates 625 KHz.
- 6) Release the connections made in steps 2), 3), and 4) after completion of adjustment.

• APC adjustment in playback mode

- 1) Playback the alignment tape (PAL colour-bar signal) by using deck-(1) or (2).

- 2) Connect the frequency counter to TP501.
- 3) Adjust R534 (APC adjustment in playback mode) as the frequency counter indicates 4.433619 MHz.

• 4.44 MHz adjustment

- 1) Playback the alignment tape (colour-bar signal) by using deck-(1) or (2).
- 2) Connect the frequency counter to TP503.
- 3) Adjust C578 (4.44 MHz control) as the counter indicates 4.435572 MHz.

• Adjustment of carrier balance

- 1) Playback the alignment tape (PAL colour-bar signal) by using deck-(1) or (2).
- 2) Connect the oscilloscope to video output terminal.
- 3) Set R577 (chrominance level control in playback mode) midway.
- 4) Adjust R543 (carrier balance control) to minimize carrier leak as shown in figure 38.

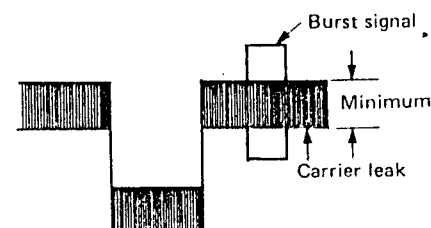


Figure 38.

• Adjustment of video signal level in playback mode

- 1) Playback the alignment tape (PAL colour-bar signal) by using deck-(1) or (2).
- 2) Connect the oscilloscope to the video output terminal.
(Note: Connect a 75 ohm (resistor) between video output terminal and ground.)
- 3) Adjust R476 (Luminance level control in playback mode) to 1v p-p as shown in figure 39.

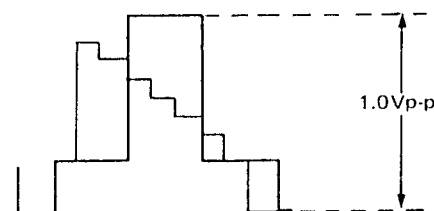


Figure 39.

• Adjustment of chroma level in playback mode

- 1) Playback the alignment tape (PAL colour-bar signal) by using deck-(1) or (2).
- 2) Connect the oscilloscope to the video output terminal.
(Note: Connect a 75 ohm (resistor) between video output terminal and ground.)
- 3) Adjust the burst signal level to 0.25Vp-p by using R577 as shown in figure 40.

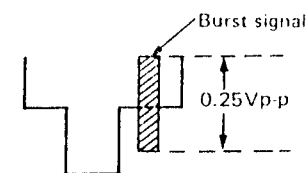


Figure 40.

ADJUSTMENT OF HEAD AMPLIFIER CIRCUIT

1. Test point layout

Deck-(1): DUNTK 1455HE50 (Fig.41)

Deck-(2): DUNTK 1456HE50 (Fig.42)

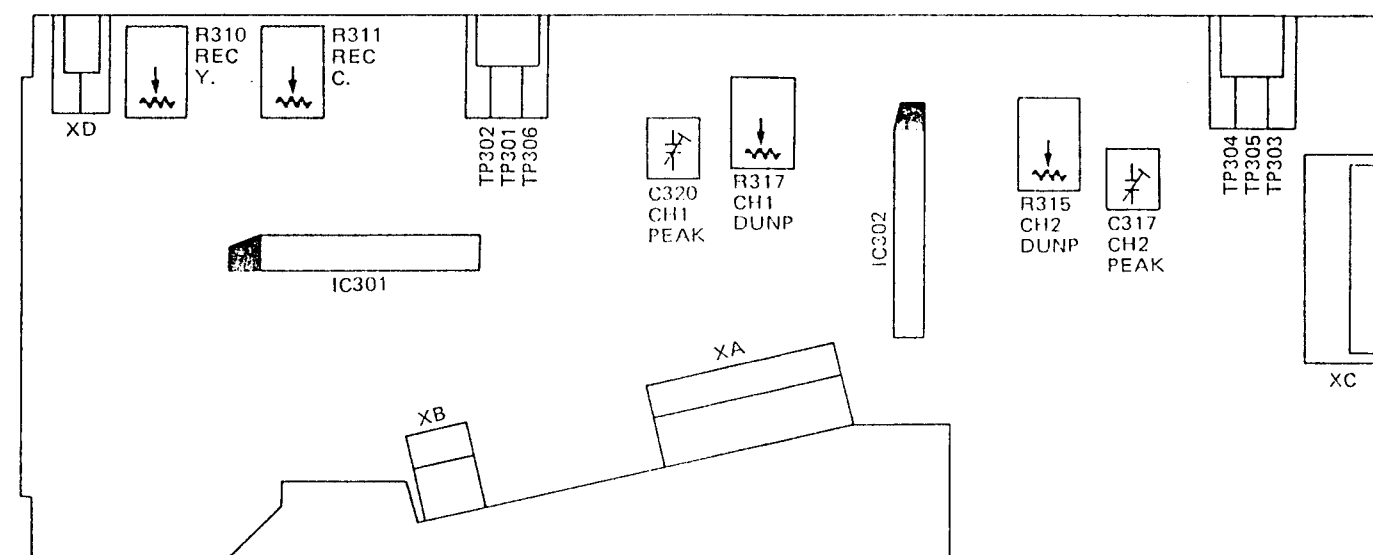


Figure 41.

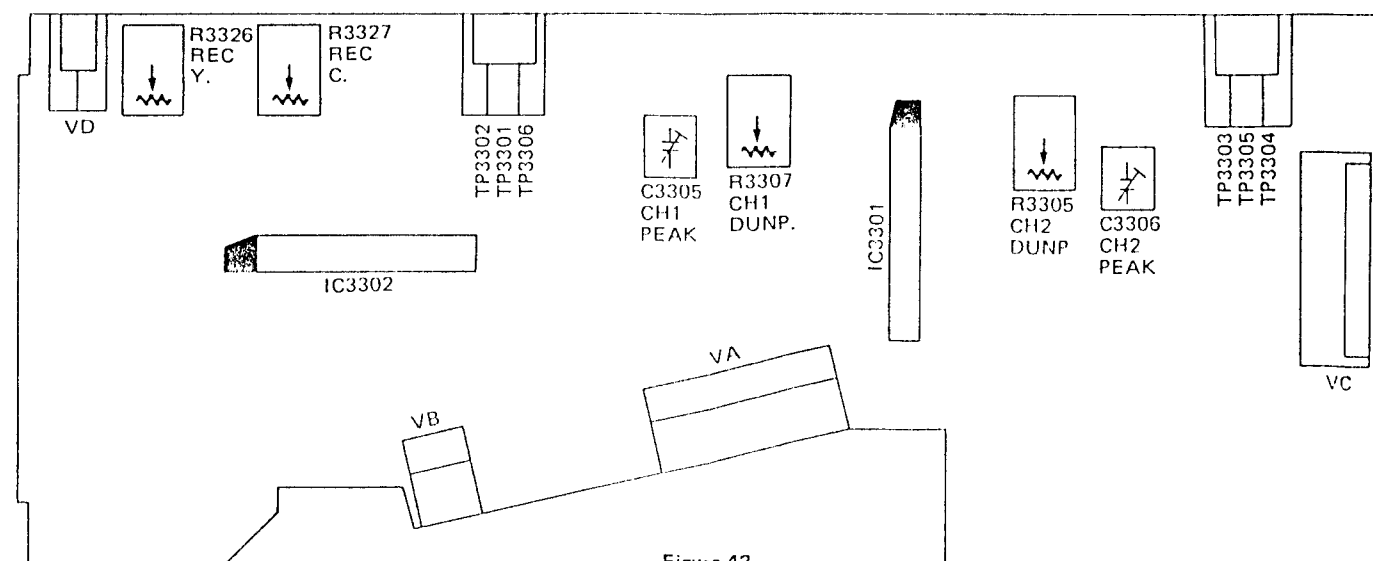


Figure 42.

• Adjustment of deviation in editing mode

- 1) First, set deck-(1) or (2) to the recording mode.
- 2) Input the PAL colour-bar signal to the video input terminal.
- 3) Connect the oscilloscope to pin ①⑥ of IC201 and read the signal level at pin ①⑥.
- 4) Next, set the deck to the editing mode and edit the alignment tape (PAL colour-bar signal).
- 5) Adjust R261 (deviation control in playback mode) as the level at pin ①⑥ of IC201 corresponds to the level read in step 3).

Note:

This adjustment must be made after completion of FM frequency and deviation adjustment and playback video signal level adjustment.

1. Adjustment of recording current

• Adjustment of deck-(1)

- 1) Set deck-(1) to the record mode and the record system switch to PAL or AUTO.
- 2) Input the colour-bar signal to VTR.
- 3) Connect the probe of the oscilloscope between TP3302 and TP3301 (ground). The test points are arranged as shown in figure 43.

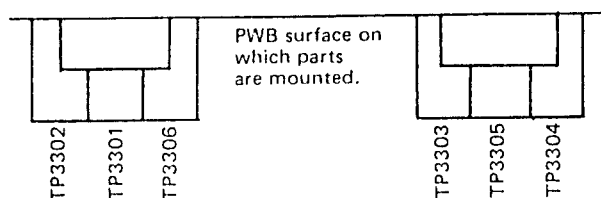


Figure 43.

- 4) First, place R3326 (Luminance control in record mode) in the minimum position. Then, adjust chroma record current to the level shown in figure 44 by using R3327 (Chrominance control in record mode).

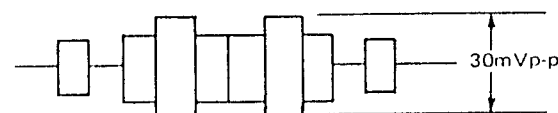


Figure 44.

- 5) Adjust FM record current to the level shown in figure 45 by using R3326 (Luminance control in record mode).

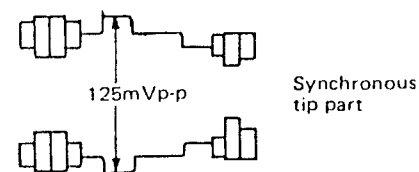


Figure 45.

• Adjustment of deck-(2)

- 1) In the same manner as deck-(1), set deck-(2) to the record mode and input the PAL colour-bar signal.
- 2) Connect the probe of the oscilloscope between TP302 and TP301 (ground). The test points are arranged as shown in figure 46.

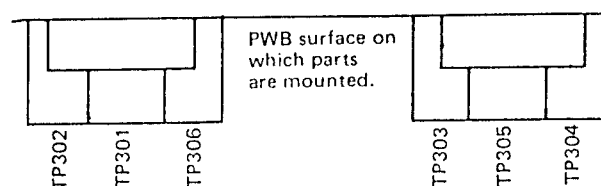


Figure 46.

- 3) First, place R310 (Luminance control in record mode) in the minimum position. Then, adjust the chroma record current to the level shown in figure 47 by using R311 (Chrominance control in record mode).

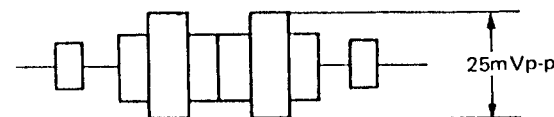


Figure 47.

- 4) Adjust FM record current to the level shown in figure 48 by using R311.

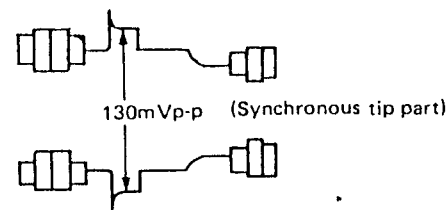


Figure 48.

2. Adjustment of playback amplifier

• Adjustment of deck-(1)

- 1) Playback the 3-hour radio frequency sweep tape.
- 2) Set the oscilloscope to the dual mode, and connect the channel-1 probe between TP3305 and TP3303 (ground) and the channel-2 probe to TP3304 (head switching pulse).
- 3) Adjust the channel-1 head output.
 - ① Maximize the channel-1 head output by using R3307 (channel-1 damping control) and adjust C3305 (channel-1 peaking control) to maximize the output at 4.8 MHz as shown in figure 49.

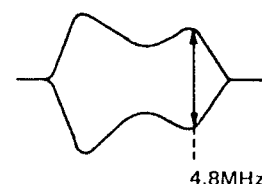


Figure 49.

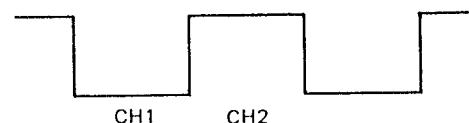


Figure 50.

- ② Adjust R3307 (channel-1, damping control) to make the output wave shape flat from 3 MHz to 4.8 MHz as shown in figure 51.

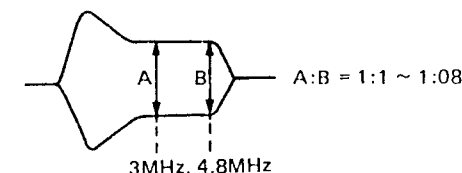


Figure 51.

4) Adjustment of channel-2 head output.

- ① Make adjustment by using R3305 (channel-2 damping control) and C3306 (channel-2 peaking control) in the same manner as the channel-1 output.
- ② Compare the output wave shape with that of channel-1, and if it is different, re-adjust the output to have the same wave shape as that of the channel-1 output.

• Adjustment of deck-(2)

- 1) Playback the 3-hour radio frequency sweep tape.
- 2) Set the oscilloscope to the dual mode, and connect the channel-1 probe between TP305 and TP304 (ground) and the channel-2 probe to TP303 (head switching pulse).
- 3) Adjust the channel-1 head output.
 - ① Maximize the channel-1 head output by using R317 (channel-1 damping control) and adjust C320 (channel-1 peaking control) to maximize the output at 4.8 MHz as shown in figure 49.
 - ② Adjust R317 (channel-1 damping control) to make the output wave shape flat from 3 MHz to 4.8 MHz as shown in figure 51.
- 4) Adjust the channel-2 head output.
 - ① Make adjustment by using R315 (channel-2 damping control) and C317 (channel-2 peaking control) in the same manner as channel-1.
 - ② Compare the output wave shape with the channel-1 head output wave shape, and if it is different, readjust the output to have the same wave shape as that of the channel-1 head output.

ADJUSTMENT OF AUDIO CIRCUIT (DECK-1)

- Adjustment of audio level in playback mode
 - 1) Playback the alignment tape (1-KHz calibration signal) by using deck-(1).
 - 2) Connect the vacuum tube voltmeter to audio output terminal.
 - 3) Adjust R614 (audio level control in playback mode) as the vacuum tube voltmeter indicates -9.0 dBm.
- Adjustment of bias current in record mode
 - 1) Set deck-(1) to the recording mode.
 - 2) Connect the vacuum tube voltmeter to the both ends of R8007 (10 ohm) of the audio head as shown in figure 52.
 - 3) Inhibit any signal input to the audio input terminal.
 - 4) Adjust R635 (bias (1) control in record mode) as the vacuum tube voltmeter indicates 3.5 mVrms.

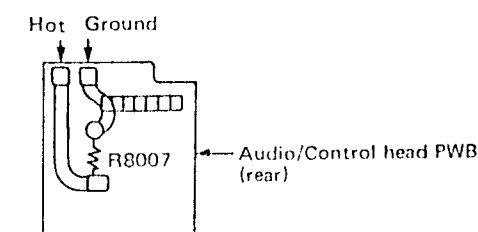


Figure 52.

ADJUSTMENT OF AUDIO CIRCUIT (DECK-2)

- Adjustment of audio level in playback mode
 - 1) Playback the alignment tape (1-KHz calibration signal) by using deck-(2).
 - 2) Connect the vacuum tube voltmeter to the audio output terminal.
 - 3) Adjust R6608 (audio level (2) control in playback mode) as the vacuum tube voltmeter indicates -9.0 dBm.
- Adjustment of bias current in record mode
 - 1) Set deck-(2) to the recording mode.
 - 2) Connect the vacuum tube voltmeter to the both ends of R8007 (10 ohm) of the audio head for deck-(2) as shown in figure 52.
 - 3) Inhibit any signal input to the audio input terminal.
 - 4) Adjust R6601 (bias control in record mode) as the vacuum voltmeter indicates 3.5mVrms.

ADJUSTMENT OF SERVO CIRCUIT

- Test point layout (DUNTK1462HE00)

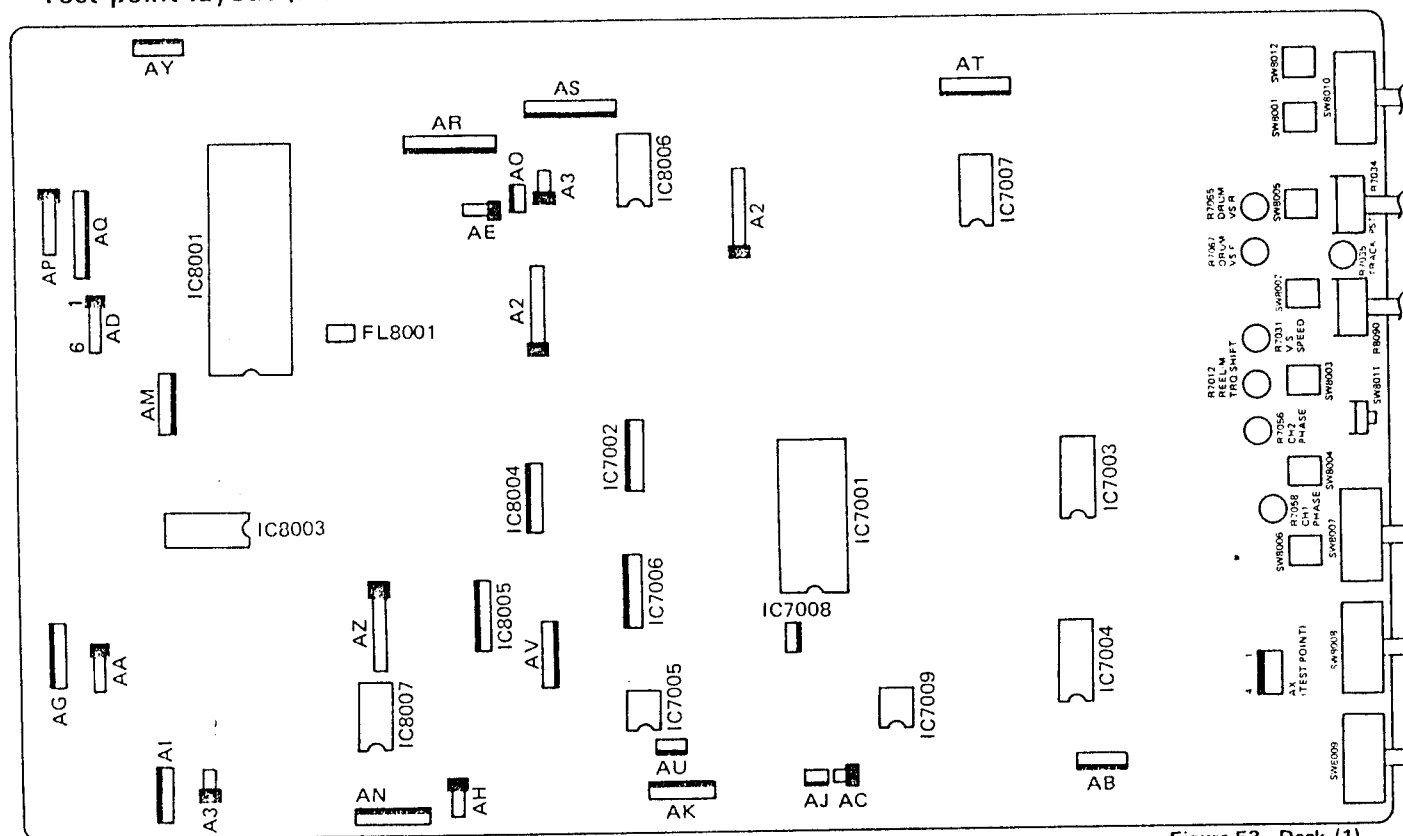


Figure 53. Deck (1)

- Test point layout (DUNTK1463HE00)

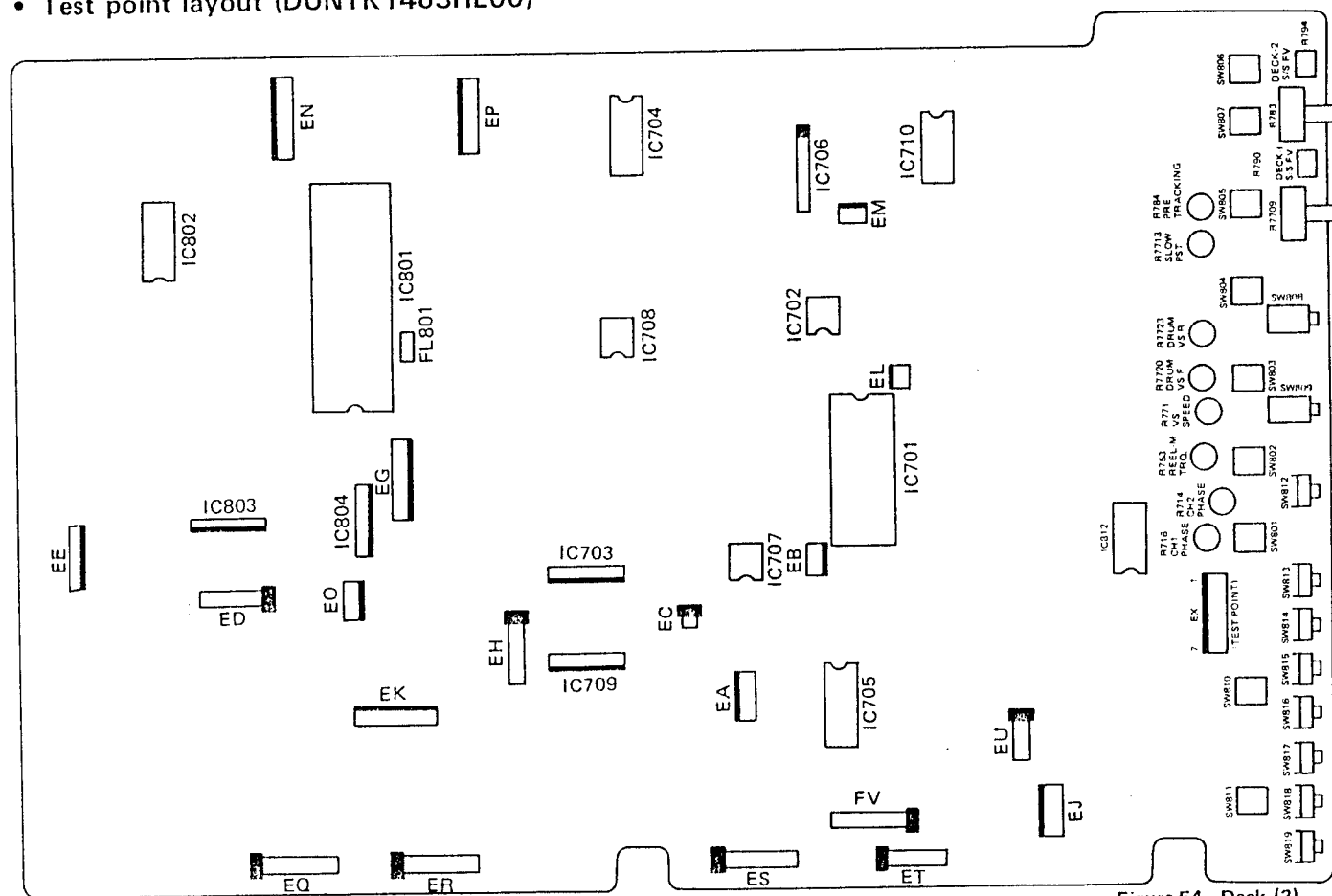


Figure 54. Deck (2)

Record mode: Recording available tape

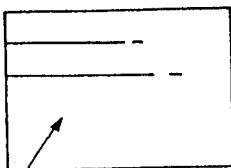
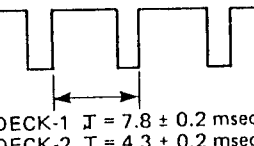
Playback mode: VR-OCPZC (Colour bar)

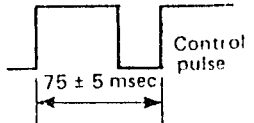
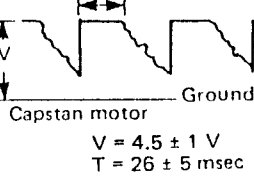
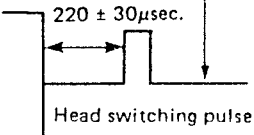
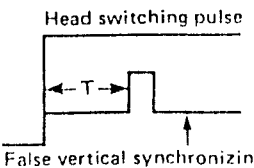
Tape used

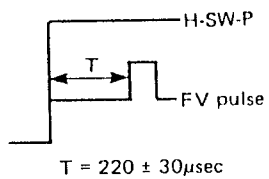
DECK-1: DUNTK1462HE00

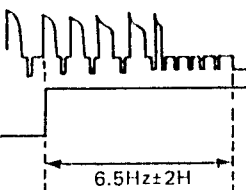
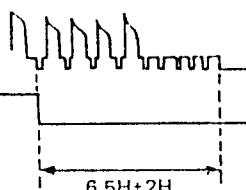
DECK-2: DUNTK1463HE00

Step No.	Adjustment item	Mode	Adjustment method	Test pin, VR No.		Waveshape & Remarks
				Deck-(1)	Deck-(2)	
1.	Reel torque rough adjustment	Record	Adjust the voltages at both ends of reel motor to $2.0 \pm 0.1V$. ($175 \pm 15gcm$)	Reel motor Both (+) and (-) ends R753	Reel motor Both (+) and (-) ends R7012	Final adjustment is made to $175 \pm 15gcm$ by using mechanical torque gauge.
2.	Tracking monostable-multi-vibrator preset adjustment	Play-back	1) Set user tracking control to center click position in playback mode. 2) Adjust tracking monostable-multi-vibrator signal within $20 \pm 1msec$.	AX—1 R7035 Tracking preset control R7034 (User tracking control)	EX—2 R784 Tracking preset control R783 (User tracking control)	
3.	Playback switching point adjustment (1) Channel-1 phase (2) Channel-2 phase	Play-back Play-back	1) Externally trigger video output signal with head switching pulse. 2) Adjust Channel-1 phase within $6.5 \pm 0.5H$ at falling edge of head switching pulse. 1) Externally trigger video output signal with head switching pulse. 2) Adjust Channel-2 phase within $6.5 \pm 0.5H$ at leading edge of head switching pulse.	VIDEO OUT (Trigger) AX—2 R7058	VIDEO OUT (Trigger) EX—3 R716	
4.	Video search speed adjustment 1) VS—FF (Video search-fast forward) mode drum shift adjustment	Play-back VS—FF	1) Adjust horizontally synchronized signal to the range within $15.625 KHz \pm 0.5\%$.	VIDEO OUT R7067	VIDEO OUT R7720	(Rough adjustment) No unevenness must be found visually at the joints in colour-bar signal.

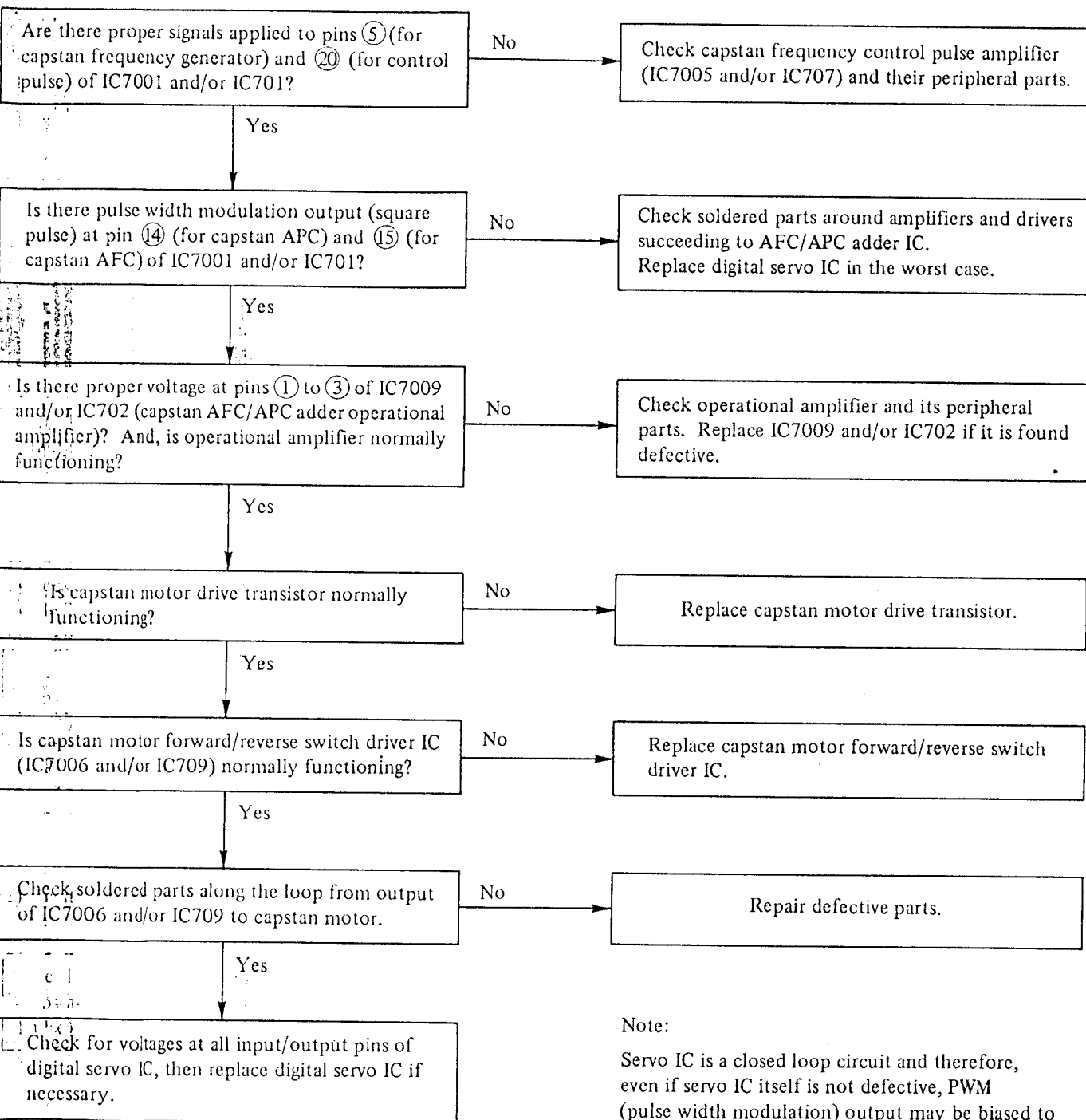
Step No.	Adjustment item	Mode	Adjustment method	Test pin, VR No.		Waveshape & Remarks
				Deck-(1)	Deck-(2)	
4.	2) VS—FF mode speed adjustment	VS—FF	1) Deck-(1) (5-times speed) ① Adjust as two noise bars appear. ② Check if control pulse cycle ranges within $7.8 \pm 0.2\text{ms}$. 2) Deck-(2) (9-times speed) ① Adjust as 4 noise bars appear. ② Check if control pulse cycle ranges within $4.3 \pm 0.2\text{ms}$. Adjust horizontally synchronous frequency to the range within $15.625\text{KHz} \pm 0.5\%$.	Visual check R7031 AX—4 (Control pulse)		Monitor Television  Minimize the vertical movement of the noise bars  DECK-1 $T = 7.8 \pm 0.2 \text{ msec}$ DECK-2 $T = 4.3 \pm 0.2 \text{ msec}$
	3) VS—REW (Video search-rewind) mode drum shift adjustment	VS—REW	Adjust horizontally synchronous frequency to the range within $15.625\text{KHz} \pm 0.5\%$.	VIDEO OUT R7065	VIDEO OUT R7723	(Rough adjustment) Same as VS—FF mode.
	4) VS—REW mode speed confirmation		1) Deck-(1) (5-times speed) ① Check 3 noise bars. ② Check if control pulse cycle ranges within $8.2 \pm 0.2\text{ms}$. 2) Deck-(2) (9-times speed) ① Check 5 noise bars. ② Check if control pulse ranges within $4.7 \pm 0.2\text{msec}$.	Visual check AX—4 (Control pulse)		Same as VS—FF mode adjustment. Note: Re-adjust VS—FF speed control as the flows on VS—FF mode and REW mode sides become the same if noise bars of VS—REW mode flow fast upward or downward.

Step No.	Adjustment item	Mode	Adjustment method	Test pin, VR No.		Waveshape & Remarks
				Deck-(1)	Deck-(2)	
5.	Slow drive adjustment	Play-back Slow	1) Set user slow control to 1/2 slow (right most). 2) Adjust control pulse signal within $75 \pm 5\text{msec}$. 3) Check Slow drive. Check waveshape of EX—4 by using EX—5 as ground of the probe.		EX—1 R7713 Between EX—4 and EX—5	 Control pulse Ground, voltages at both ends of capstan motor.  Capstan motor $V = 4.5 \pm 1 \text{ V}$ $T = 26 \pm 5 \text{ msec}$
6.	Adjustment of false vertical synchronizing signal (Confirmation) a) Slow/still mode, False vertical synchronizing pulse	Play-back Still	1) Check if the elapsed time between the falling edge of head switching pulse and the leading edge of false vertical synchronizing pulse ranges in $220 \pm 30\mu\text{s}$. 2) Adjust the time between the leading edge of head switching pulse and the leading edge of false vertical synchronizing pulse to the best point to prevent vertical oscillation in the still mode. (About $250\mu\text{sec}$ as a reference value.)	EX—6 (Trigger) AX—2 (Head switching pulse) (1) R790	EX—6 (Trigger) EX—3 (Head switching pulse) (2) R794	Note) Control for adjusting false vertical synchronizing pulse of deck-1 is also located in deck-2 (DUNT1463HE-00)  False vertical synchronizing $220 \pm 30\mu\text{sec}$ Head switching pulse Head switching pulse false vertical synchronizing pulse. $T = \text{about } 250\mu\text{sec}$.  Head switching pulse False vertical synchronizing

Step No.	Adjustment item	Mode	Adjustment method	Test pin, VR No.		Waveshape & Remarks
				Deck-(1)	Deck-(2)	
6.	False vertical synchronizing signal adjustment (confirmation) b) VS-FV	Play-back VS-FF (REW)	<p>Note)</p> <p>① Adjust deck-1 to prevent oscillation in picture without noise bar as you can.</p> <p>② Use the Slow mode for deck-2, change it to the Still mode, and adjust to prevent oscillation in picture.</p> <p>③ Visually check the best point.</p> <p>Check if the time between the leading edge of head switching pulse and the leading edge of false vertical synchronizing pulse ranges in $220 \pm 30 \mu\text{s}$. Note: If horizontal lines of colour-bar signal extremely oscillate in video search mode, reconfirm playback switching point adjustment in adjustment item No.3 and adjust to minimize phase difference between Channel-1 and Channel-2.</p>	EX-6 (Trigger) AX-2 (Head switching pulse) (1)	EX-6 (Trigger) EX-3 (Head switching pulse) (2)	<p>Head switching pulse, false vertical synchronizing pulse.</p>  <p>$T = 220 \pm 30 \mu\text{sec}$</p>

Step No.	Adjustment item	Mode	Adjustment method	Test pin, VR No.		Waveshape & Remarks
				Deck-(1)	Deck-(2)	
7.	Phase checking in Record mode	Record	<p>1) Externally trigger video output signal with head switching pulse.</p> <p>2) Check if the time between the leading and falling edges of head switching pulse ranges in $6.5 \pm 2H$ by triggering.</p> <p>(1) Channel-1 record phase (2) Channel-2 record phase</p>	VIDEO OUT (Trigger) AX-2	VIDEO OUT (Trigger) EX-3	<p>(1) Vertical synchronizing Video output signal</p>  <p>(2)</p>  <p>$6.5 \text{ Hz} \pm 2H$</p> <p>$6.5 \text{ Hz} \pm 2H$</p>

2) Capstan servo is not available

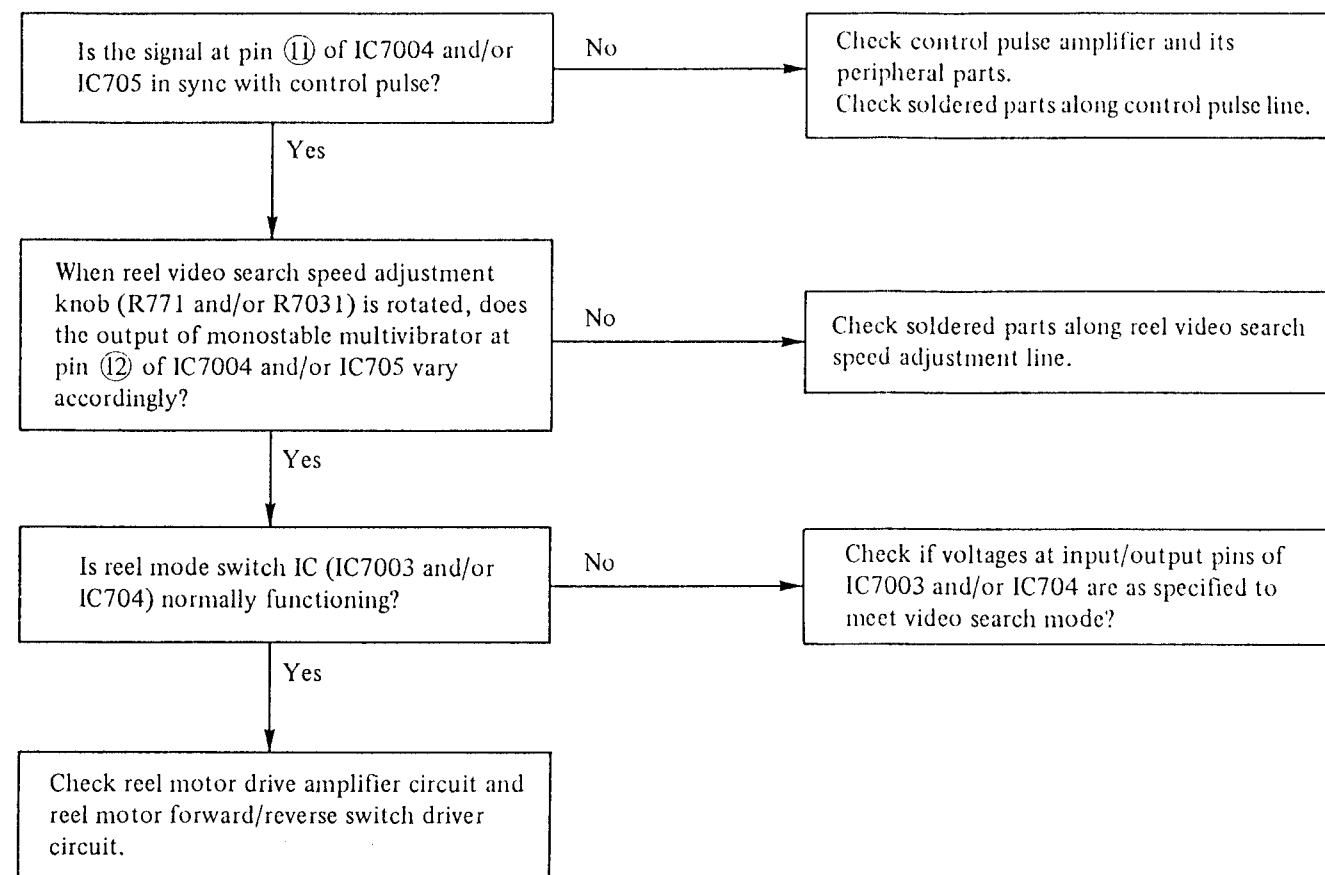


Note:

Servo IC is a closed loop circuit and therefore, even if servo IC itself is not defective, PWM (pulse width modulation) output may be biased to either High or Low level if amplifier/output stage is defective: in this case, there appears no square wave pulse at pins 14 and 15 of IC7001 and/or IC701.

3) Reel servo is not available.

* Reel motor's speed in video search mode is not as specified.



ADJUSTMENT OF POWER CIRCUIT

• Test point layout

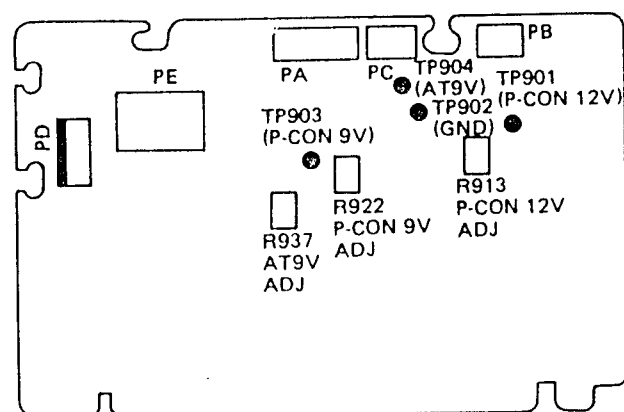


Figure 55.

• Preparation.

- 1) Set the rated voltage to AC110V/127V (low tap) or 220V/240V (high tap).
- 2) Set deck-(1) and deck-(2) to the playback and record modes, respectively.

• Checking and Adjustment

- 1) (Checking voltage of AT 13V)
Check if the voltage between pin ⑥ (AT13V) of PA connector and TP-902 (ground) ranges is $13V \pm 0.5V$. If the voltage deviates from the range, adjust R19 (13.6 V adjusting control) in the power circuit board (RUNTK0260GEZZ).
- 2) (Adjusting voltage of AT 9V)
Check if the volatage between TP-904 (AT9V) and TP-902 (ground) ranges in $9.0 \pm 0.3V$. If it deviates from the range, adjust R937 (AT 9V adjsuting control).
- 3) (Adjusting voltage of 12V)
Check if the voltage between TP-901 (12V) and TP-902 (ground) ranges in $12.0 \pm 0.2V$. If it deviates from the range, adjust R913 (12 V adjusting control).

- 4) (Adjusting voltage of power control 9V)
Check if the voltage between TP-903 (power control 9V) and TP-902 (ground) ranges in $9.0 \pm 0.2V$. If it deviates from the range, adjust R922 (9V adjusting control).

GLOSSARY

A	ABSS	Automatic Blank Search System	K	KE	Key Entry
	A/C	Audio/Control		LED	Light Emitting Diode
	ACL	Auto Clear		LEV	Level
	AD	Address		LDM	Loading Motor
	ADJ	Adjustment		LPF	Low Pass Filter
	AFC	Automatic Frequency Control	M	MIC	Microphone
	AFT	Automatic Fine Tuning		MM	Monostable-Multivibrator
	AGC	Automatic Gain Control	N	NTSC	National Television System Committee
	A-Mute	Audio Mute			
	AL	After Loading	O	OPE	Operation
B	ALC	Automatic Level Control		OSC	Oscillator
	APC	Automatic Phase Control	P	PAD	Power Assisted Drive
	AT	All Time		PAL	Phase Alternation by Line
	AV	Audio/Video		PB	Playback
				PBAL	Playback After Loading
				PCM	Pulse Code Modulation
				P-CON	Power Control
				PG	Pulse Generator
				PIF	Picture Intermediate Frequency
				PR	Pinch Roller
				PWB	Printed Wiring Board
C				PWM	Pulse Width Modulation
	CAP	Capstan	R	REC	Record
	CST.M.	Cassette Motor		REF	Reference
	CCIR	International Radio Consultative Committee		REM	Remote Control
				REV	Reverse
	C.FG	Capstan Frequency Generator		REW	Rewind
	CH	Channel		RF	Radio Frequency
	C.PG	Capstan Pulse Generator		R/P CTL	Record/Playback Control
	CTL	Control			
			S	S/H	Sample Hold
				S.I.	Supply Impedance
D	DC	Direct Current		SIF	Sound Intermediate Frequency
	DD	Direct Drive		SS	Start Sensor
	DET	Detector		STILL-H	Still High Level
	D.F.G.	Drum Frequency Generator		SUP-REEL	Supply Reel
	DM	Drum Motor		SW	Switch/Switching
	DOC	Drop Out Compensator	T	TI	Take-up Impedance
	D.PG	Drum Pulse Generator		TPG	Trapezoidal Generator
	DUB	Dubbing		TU-REEL	Take-up Reel
			U	UL	Unloading
E	EE	Electric to Electric			
	EF	Emitter Follower			
	EP	Extended Play			
			V	VCO	Voltage Controlled Oscillator
				VHS	Video Home System
				V-Mute	Video Mute
				V-Lock	Vertical Picture Jitter Clear-Lock
				VS(V/S)	Video Search
				VSF	Video Search Forward
				VSR	Video Search Reverse
				V. Sync.	Vertical Synchronizing
				VTVM	Vacuum Tube Voltmeter
				VXO	Vertical Crystal Oscillator
F	F-ADV-P	Frame Advance Pulse	G		
	F.E.	Full Erase			
	F.F.	Fast Forward			
	F.G.	Frequency Generator			
	F.H.	Frequency of Horizon			
	F.P.	Frame Pulse			
	F/R	Forward/Reverse			
	FREQ	Frequency			
	FV	False Vertical Sync.			
	FWD	Forward			
G	GND	Ground	H		
H	H.P.L.	High Pause Limiter	I		
	HS(H/S)	Half Speed			
	HSP	Head Switching Pulse			
	H.SYNC	Horizontal Synchronizing			
I	ID AMP.	Identical amplifier	J		
	IEC	International Electrotechnical Commission			
J	IF	Intermediate Frequency Tuning	K		

Figure 35.

OVERALL SCHEMATIC

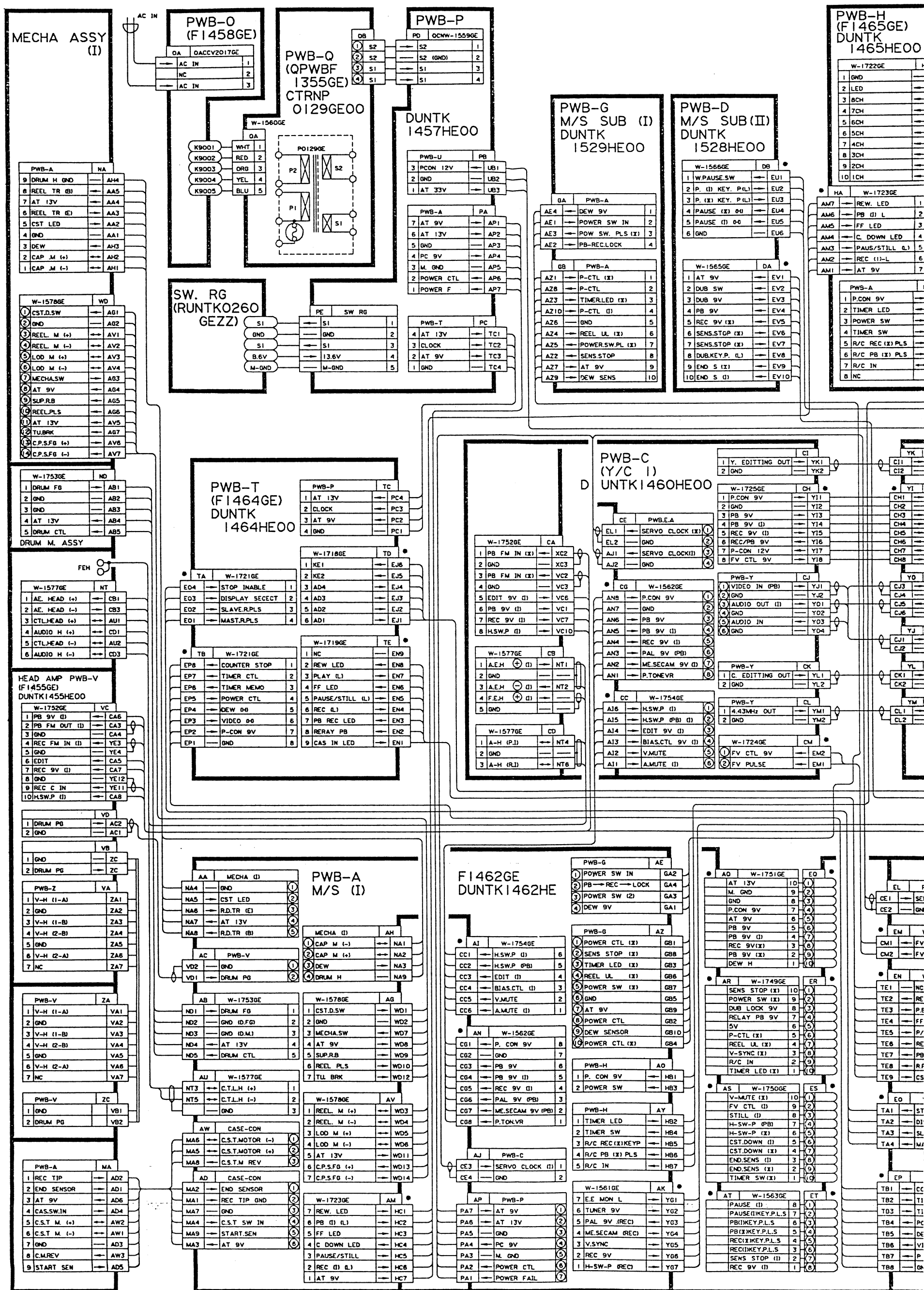


Figure 56

VC-5W20E

MECHA ASSY
(II)
PWB-N
(F1416GE)

NA PWB-E

NA	PWB-E	
H8	DRUM H GND	9
H7	TR (B)	8
H6	AT 13V	7
H5	TR (E)	6
H4	CST.LED	5
H3	GND	4
C	DEW. S	3
H2	CAP.S.M (+)	2
H1	CAP.S.M (-)	1

VS2SD1273//1

1 AT 13V
2 DRUM H GND

R8871 680Ω

ND

K40 K41

CAP STAN MOTOR
M04 (+)
RMOTPI068GE (-)

DRUM HEATER

RH-PX0046GE

K42 K43

CASSETTE LED

K45 K44

DEW SENSOR

RDTC0014GE
CAP STAN FG
RSTR-0030GE

H08

LOADING MOTOR
RMOTMI027GE (+)
M03 (-)

REEL MOTOR
RMOTVI007GE (+)
M02 (-)

TU REEL BLAKE
RPLU-0068GE

K13 K14

K04 K03

K05 K06

K10 K09

K11 K12

K07 K08

OSW-F0009GE

OSW-R0008GE

PR SW 5.6K
PR SW 3.3K
V3 SW 2.2K
UL SW

REEL SENSOR
PX0042GE

R8884 680Ω

Q8 B 81

R8882 680Ω

R8881

REEL M. ASSY

ND W-1757GE

ND	W-1757GE	
A1	DRUM FG	1
A2	GND	2
A3	GND (D.M)	3
A4	AT 13V	4
A5	DRUM CTL	5

NT W-1572GE

NT	W-1572GE	
B1	A.E.HEAD (+)	1
B3	A.E.HEAD (-)	2
B1	C.T.L. HEAD (+)	3
C1	AUDIO H (+)	4
B2	C.T.L. HEAD (-)	5
C3	AUDIO H (-)	6

H06 RHED00404GE AUDIO.E.HEAD

H05 C.T.L. HEAD

TP

H04 AUDI0 HEAD R8007 10Ω

YB4 YB5

RHEDT0012GE

PWB-N
(F1168GE)

XC W-1752GE

XC	W-1752GE	
E7	PB 9V (X)	1
A1	PB FM OUT (X)	2
A2	GND	3
E1	REC FM IN (X)	4
E2	GND	5
E8	EDIT 9V (X)	6
E10	REC 9V (X)	7
E9	REC C IN	8
E5	M.S.W.P (X)	9

XD PWB-E

XD	PWB-E	
EC2	DRUM PG (X)	1
EC1	GND	2

ROTARY TRANS PARTS
RSTR-0007GE X2
NRTR-0007GE X2

VIDEO HEAD (CH-2)

VIDEO HEAD (CH-1)

ROTARY TRANS

ROTARY TRANS

ROTARY TRANS

ROTARY TRANS

K52 K53

K50 K51

F0970GE

K60 K61

PWB-X	ZA
1 V-H (1-A)	ZA1
2 GND	ZA2
3 V-H (1-B)	ZA3
4 V-H (2-B)	ZA4
5 GND	ZA5
6 V-H (2-A)	ZA6
7 GND	ZA7

PWB-X	ZC
1 GND	XB
2 DRUM PG	XB

REC.T.SW

05 A9370

R11 15K

CNC CST D.5

W

Q1

DTA1

D2 DX014 2

R7 15K

R8 1.2K

C

02 B DTA124P

06 PX0053

D1 DX0142

R2 100K

C1 4.7μF

R1 100K

R4 15K

A NO

C2 0.01μF

BNC G. SW

03 A9370

Q4 PX0053GE

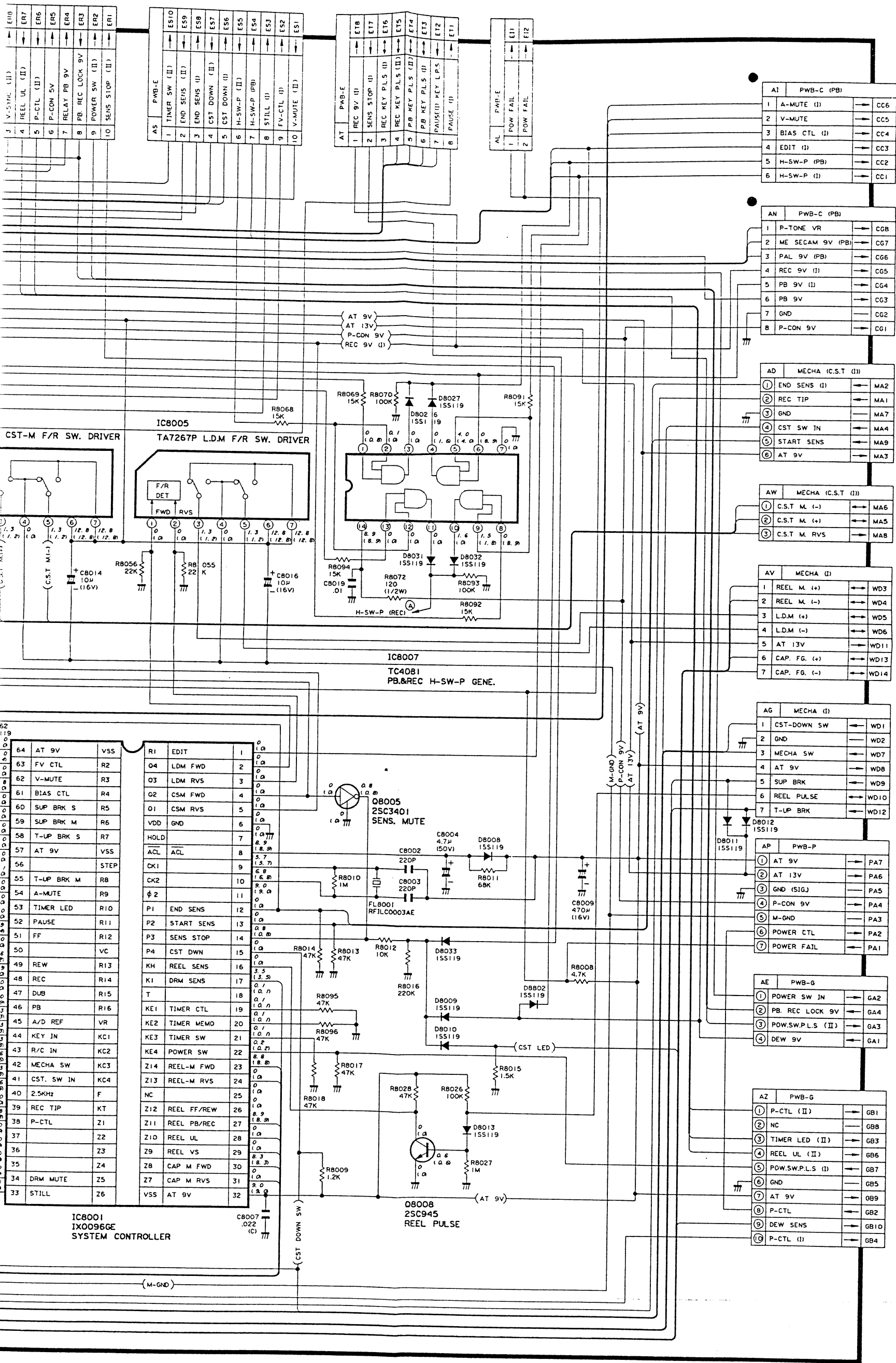
MA PWB-E

MA	PWB-E	
D2	REC.TIP	1
D1	END.SENS	2
D8	AT 9V	3
D4	CAS.SW.IN	4
D6	CST.M. (+)	5
D5	CST.M. (-)	6
D3	GND	7
D9	CM.REV	8
D7	START SENS	9

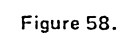
CST. M

37

EMATIC DIAGRAM (DECK-1)



NOTE: For Wiring Side PWB, refer to Fig. 71.



Drum automatic frequency control comparison signal

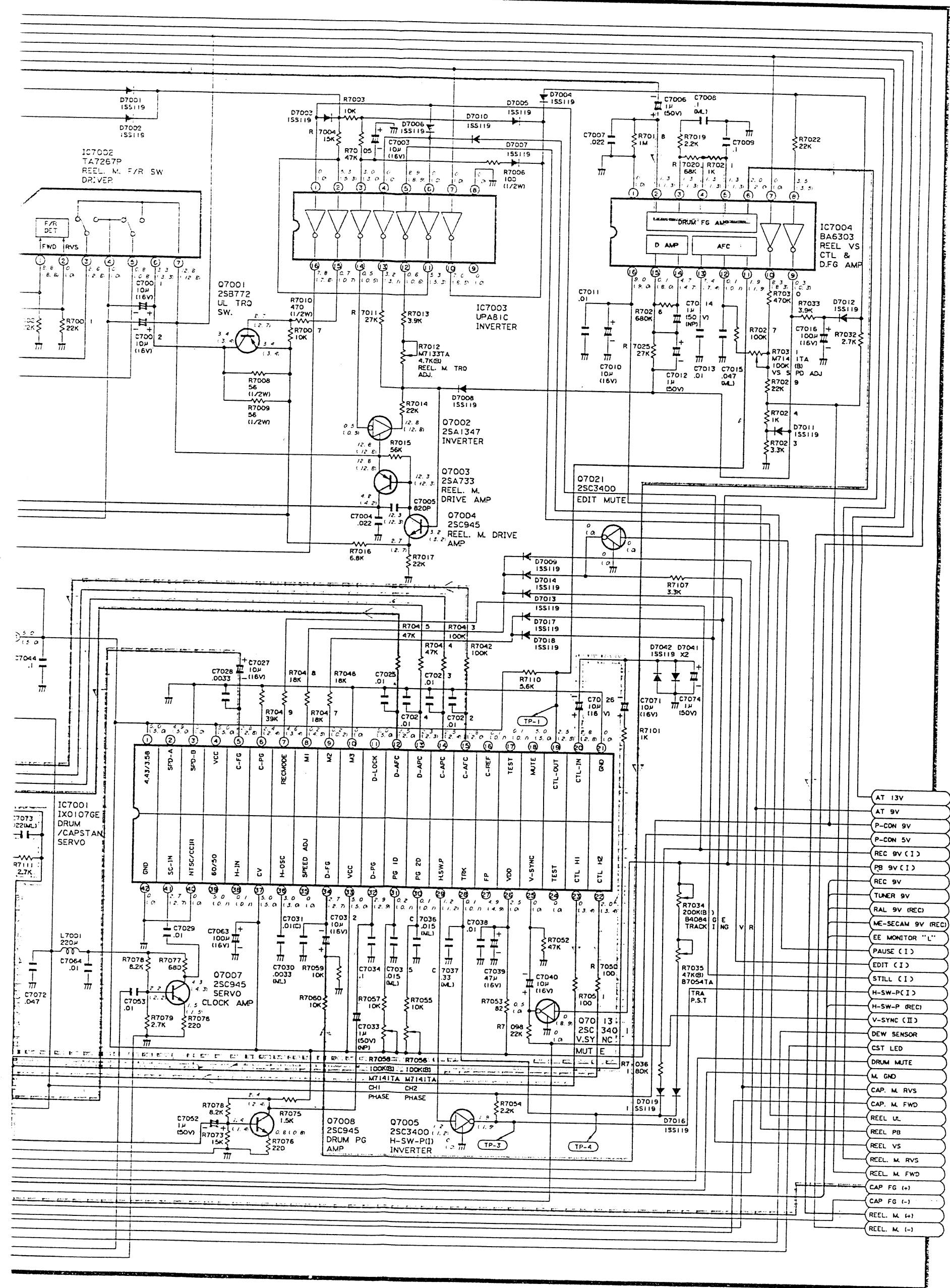
Drum automatic phase control comparison signal

Reel video search speed control signal

Capstan automatic frequency control comparison signal

Capstan automatic phase control comparison signal

NOTE: Output signals of pins (22) and (23) of IC7001 are the control pulses available only in the record mode.



A
B
C
D
E
F
G
H
I
J
K
L

PWB-E, SYSTEM CONTROL CIRCUIT SCHEMATIC DAIGRA

NOTE: For Wiring Side PWB, refer to Fig. 72.

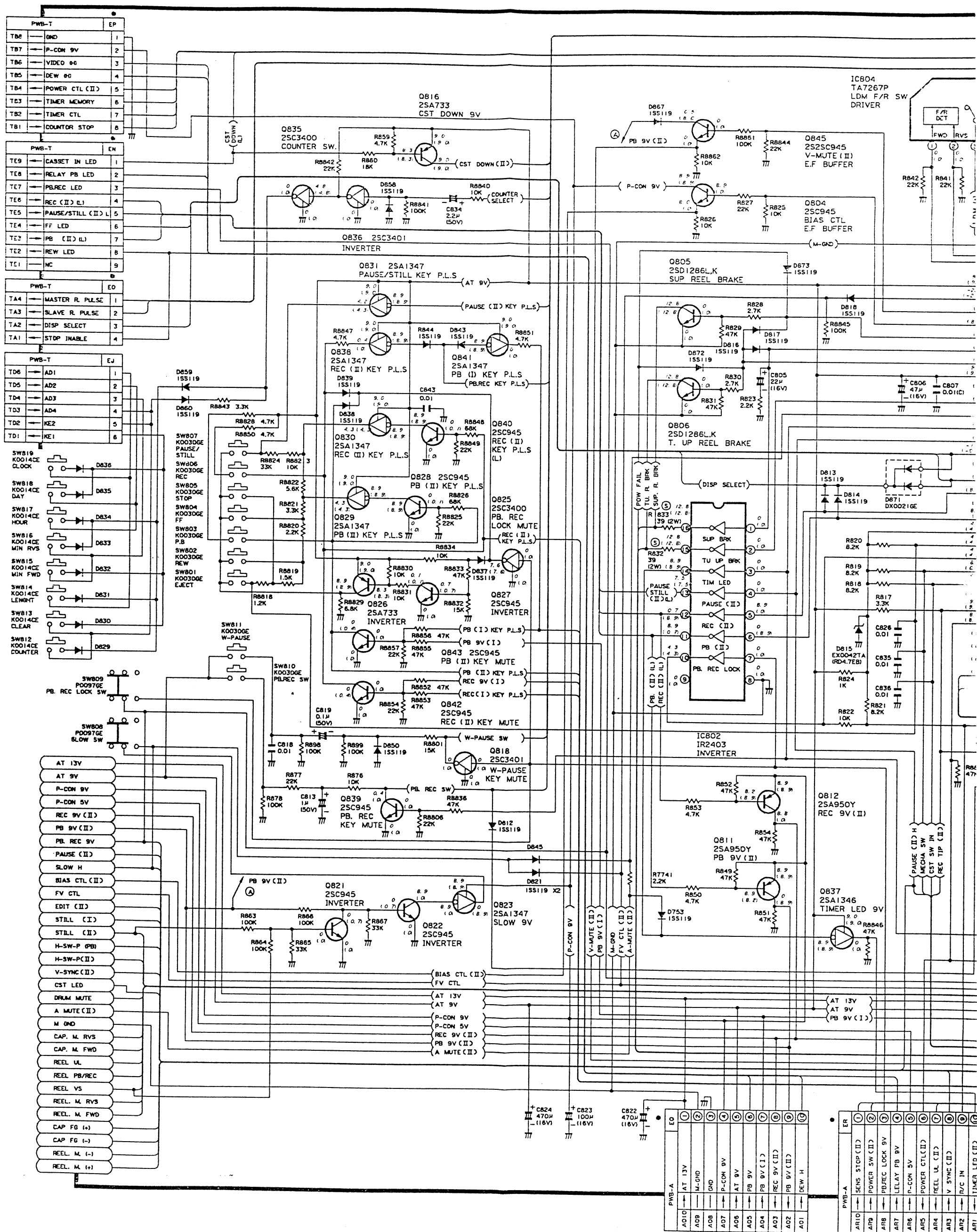
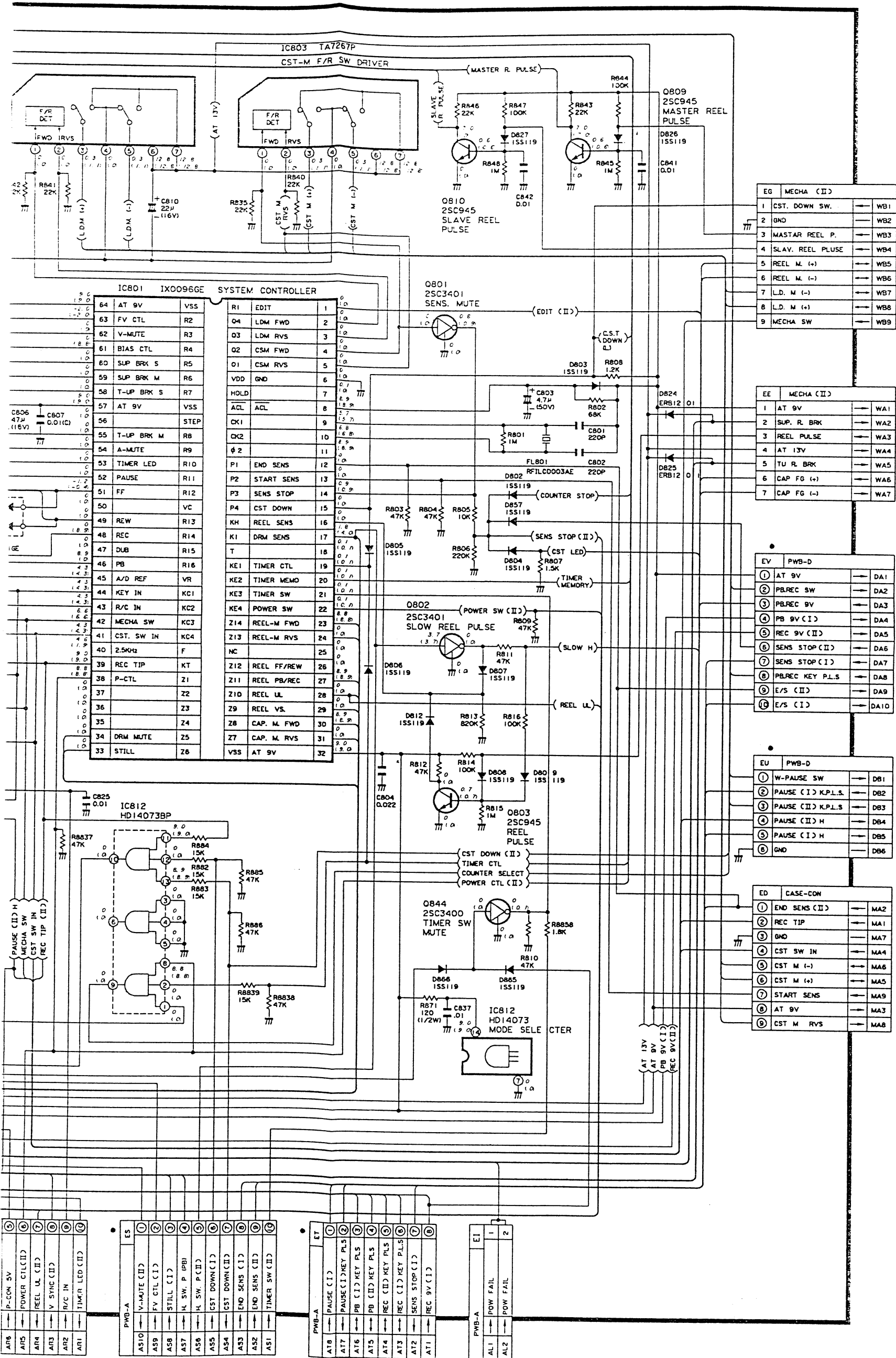


Figure 59.

DAIGRAM (DECK-2)



NOTE: For Wiring Side PWB, refer to Fig. 72.

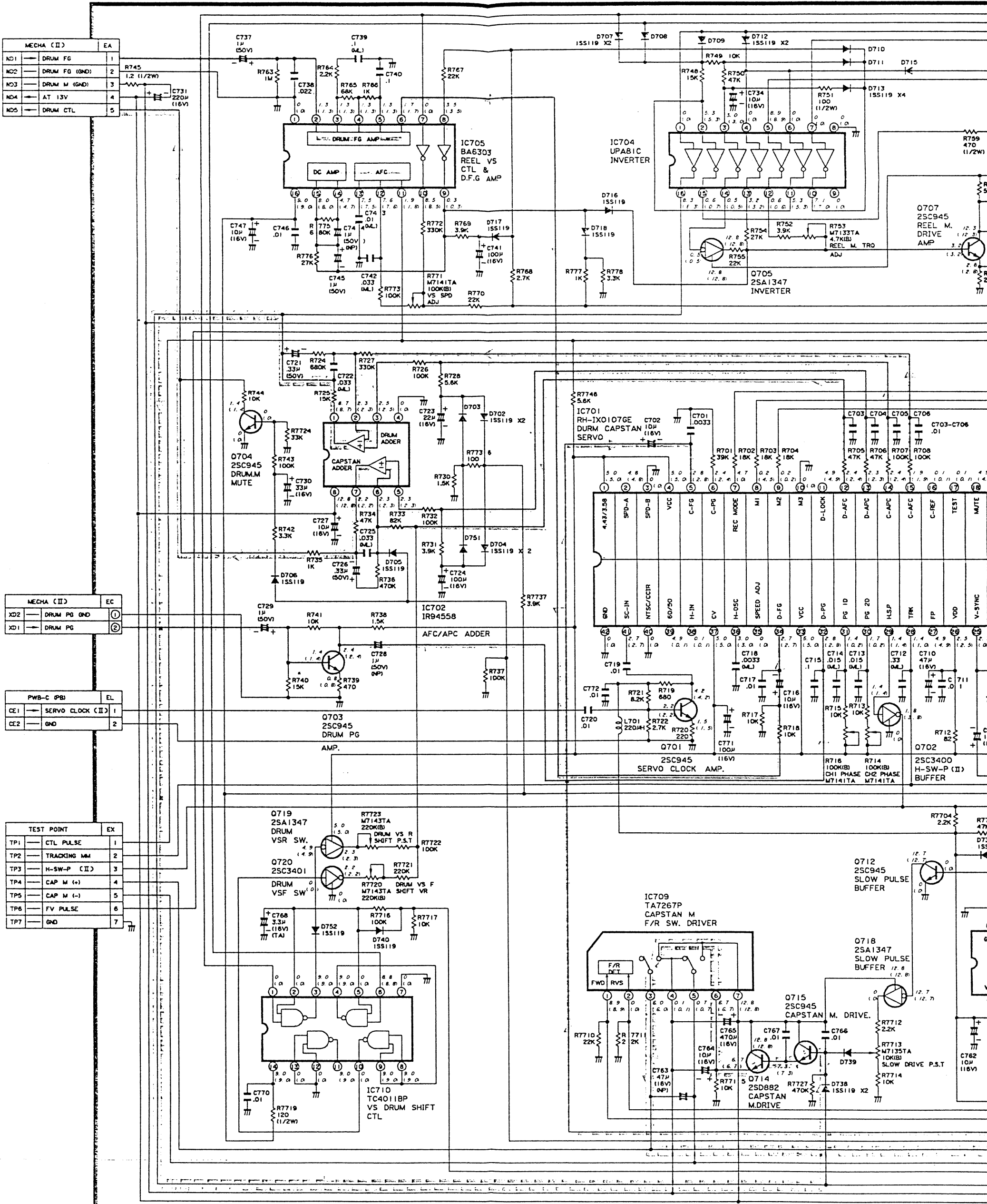


Figure 60.

Drum automatic frequency control comparison signal
 Drum automatic phase control comparison signal
 Reel video search speed control signal

Capstan automatic frequency control comparison signal
 Capstan automatic phase control comparison signal

NOTE: Output signals of pins (22) and (23) of IC701 are the control pulses available only in the record mode.

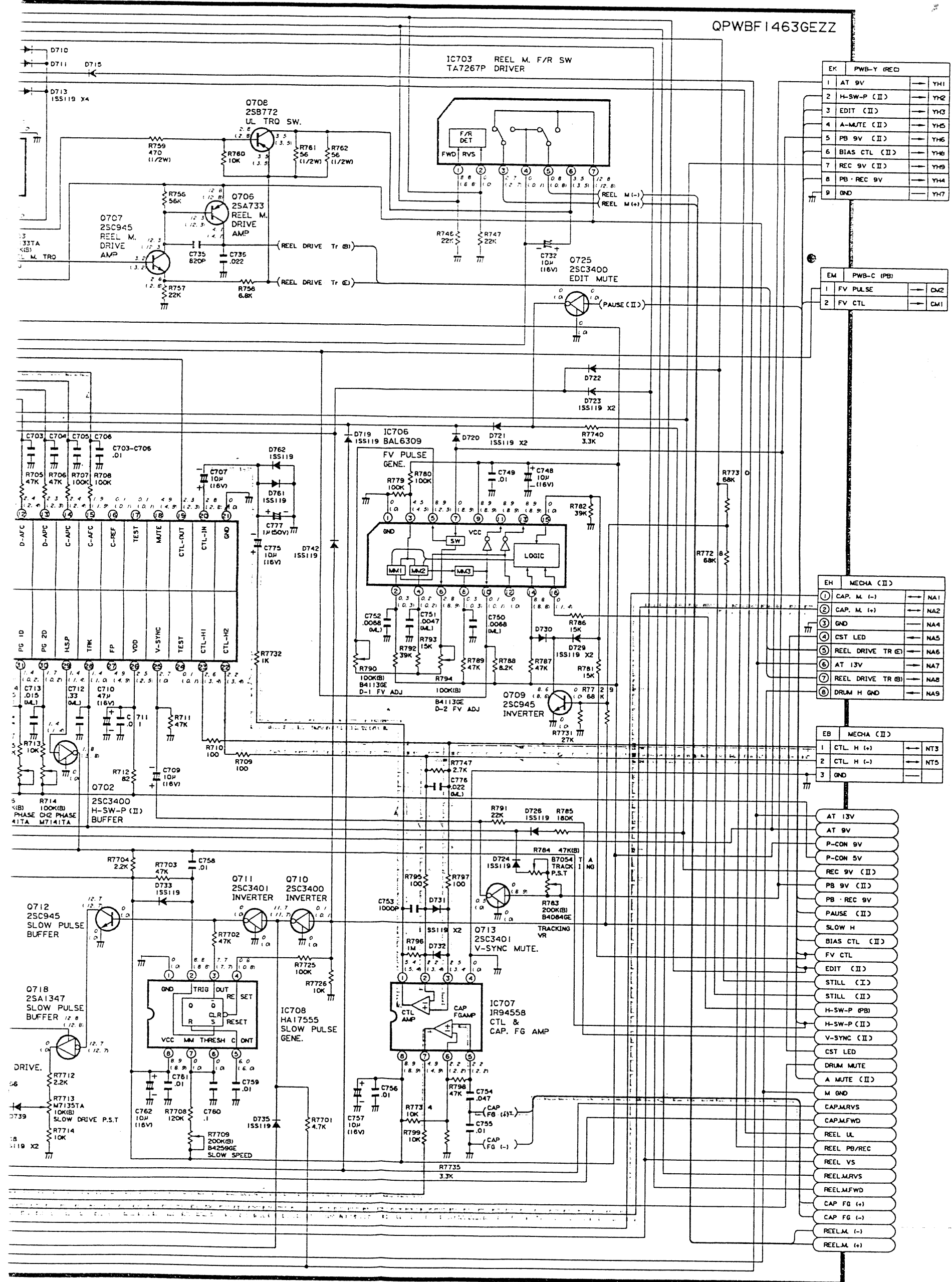


Figure 60

PWB-C, Y/C CIRCUIT SCHEMATIC DIAGRAM (DECK-1)

NOTE: For Wiring Side PWB, refer to Fig. 73.

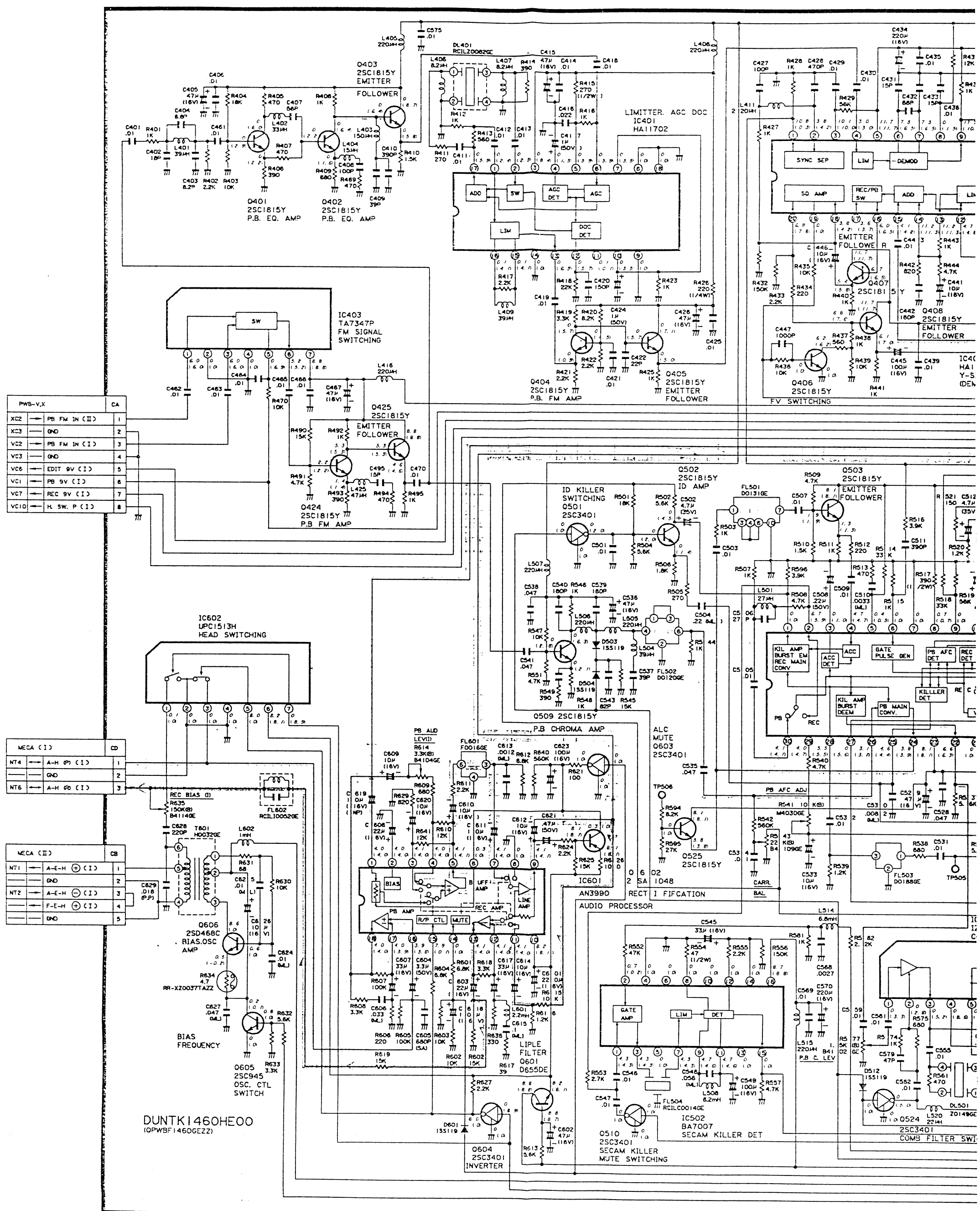
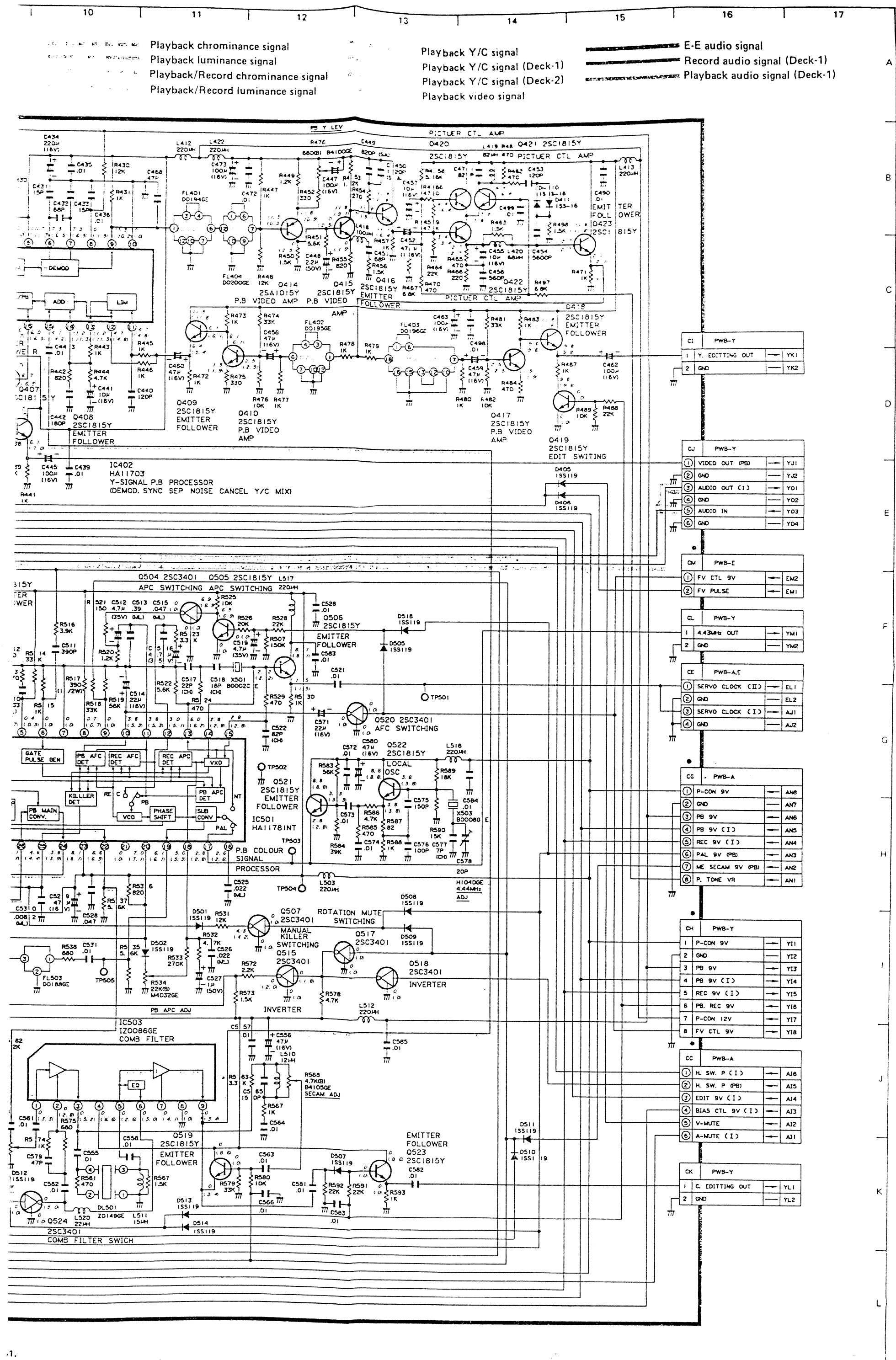




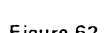


Figure 61.



	Playback audio signal (Deck-1)	
	Playback audio signal (Deck-2)	
	Record audio signal	
	Playback/Record audio signal	



-
- A vertical scale with labels A through K. The scale is a vertical line with horizontal tick marks. The labels are placed to the left of the line. A dashed horizontal line is drawn across the scale at the level of label K.

PWB-U, CHANNEL TUNING CIRCUIT SCHEMATIC DIAGRAM
PWB-H, CHANNEL SELECTOR CIRCUIT SCHEMATIC DIAGRAM
PWB-I, INTERMEDIATE FREQUENCY TUNING CIRCUIT SCHEMATIC DIAGRAM

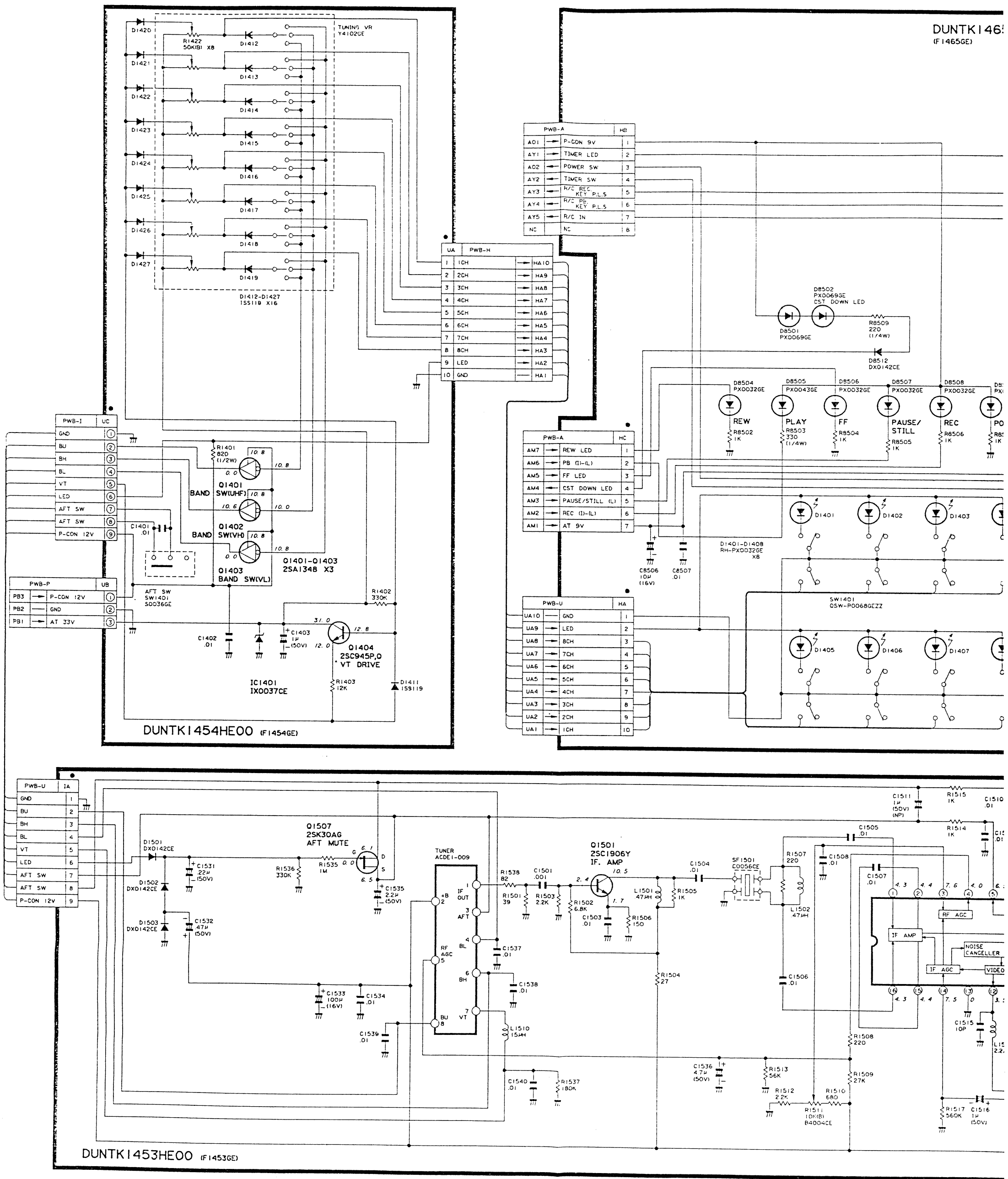
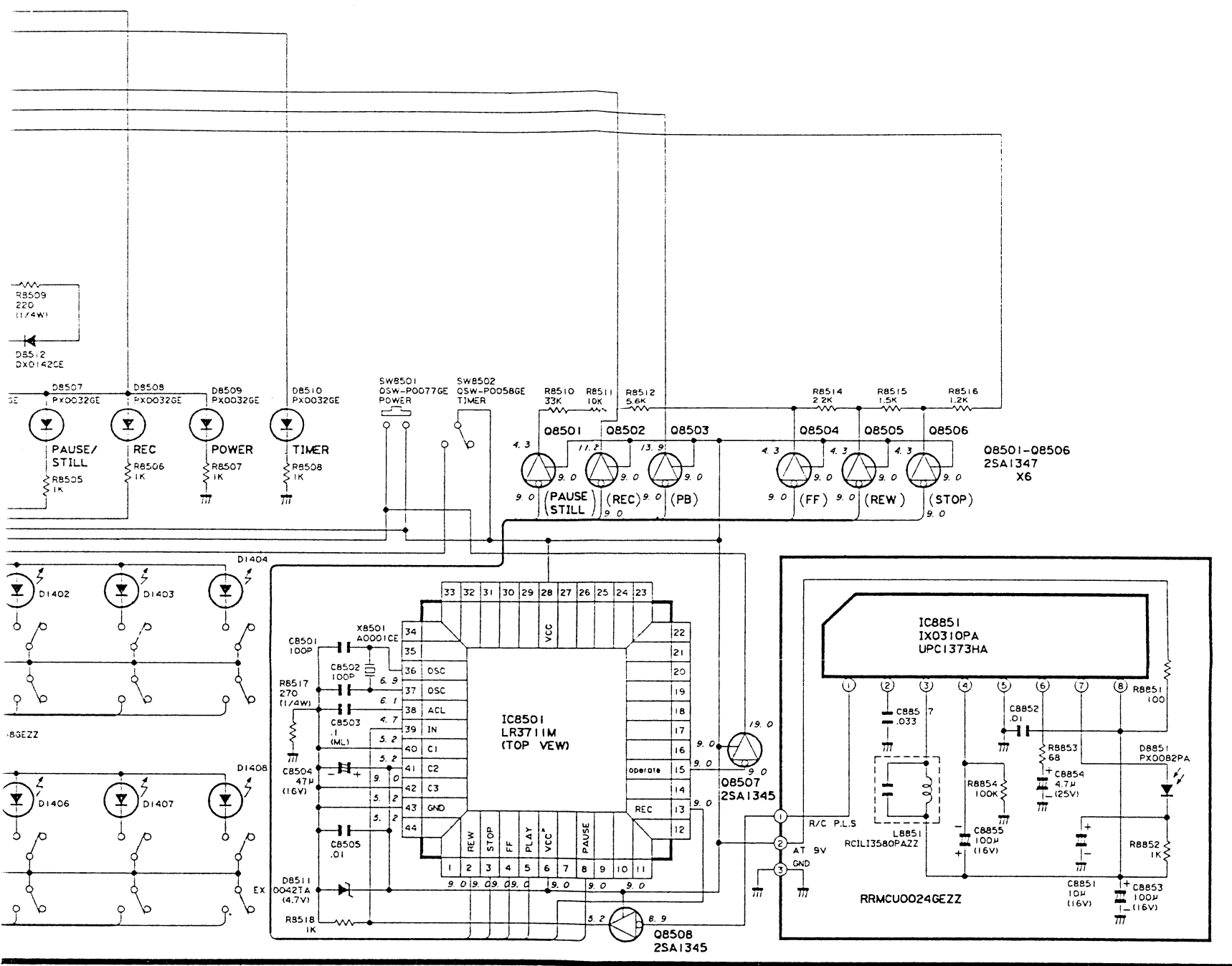


Figure 63.

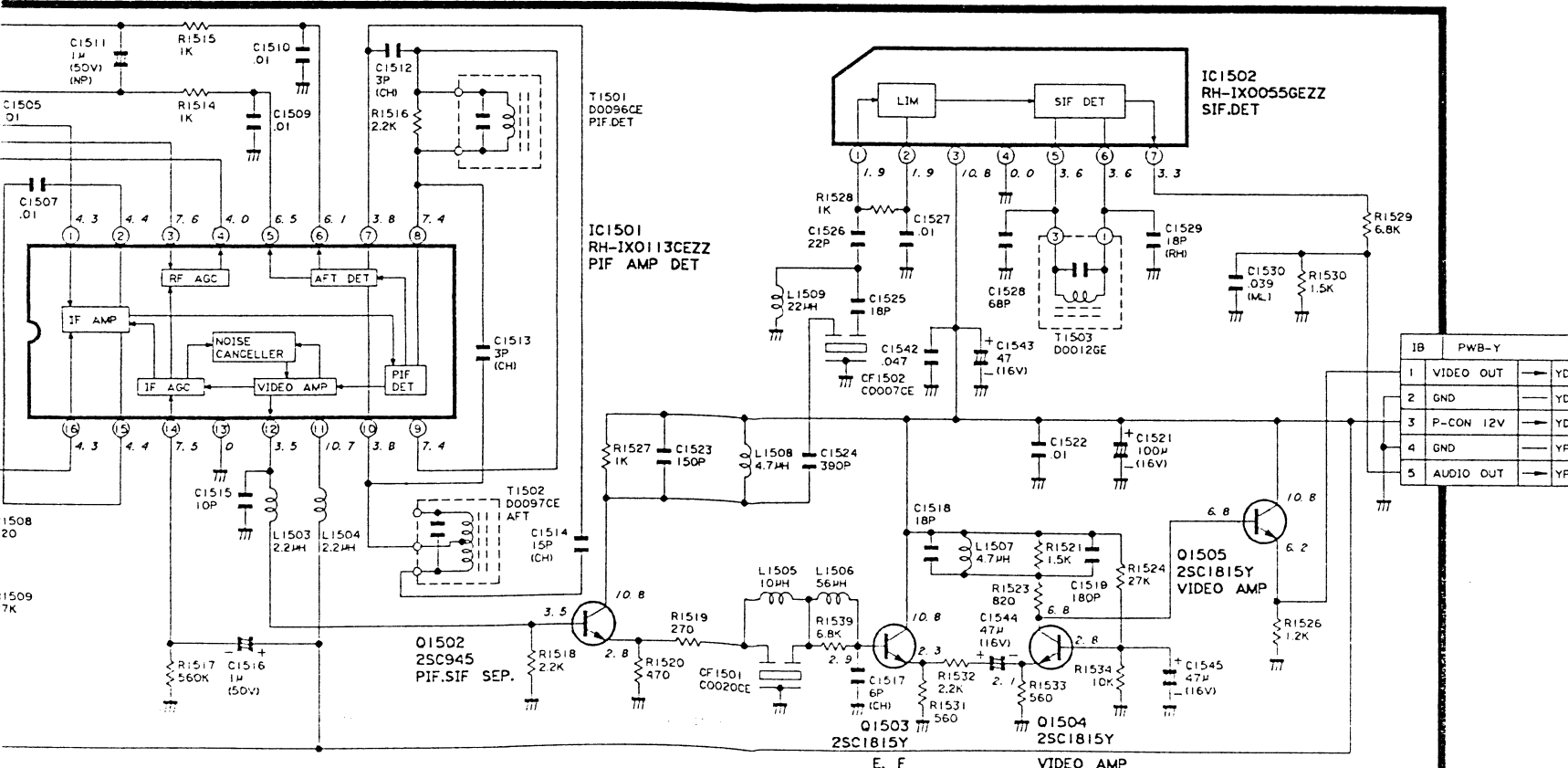
1 AM EMATIC DIAGRAM

NOTE: For Wiring Side PWB, refer to Fig. 75.
NOTE: For Wiring Side PWB, refer to Fig. 76.
NOTE: For Wiring Side PWB, refer to Fig. 77.

DUNTK1465HE00
(F1465GE)



PWB-I TUNER/IF



NOTE: For Wiring Side PWB, refer to Fig. 78.
NOTE: For Wiring Side PWB, refer to Fig. 79.



PWB-V, HEAD/RECORD AMPLIFIER CIRCUIT SCHEMATIC DIAGRAM (DECK-1)

NOTE: For Wiring Side PWB, refer to Fig. 80.

Playback FM signal (Deck-1)
Record FM signal (Deck-1)
Record chrominance signal (Deck-1)
Record Y/C signal (Deck-1)

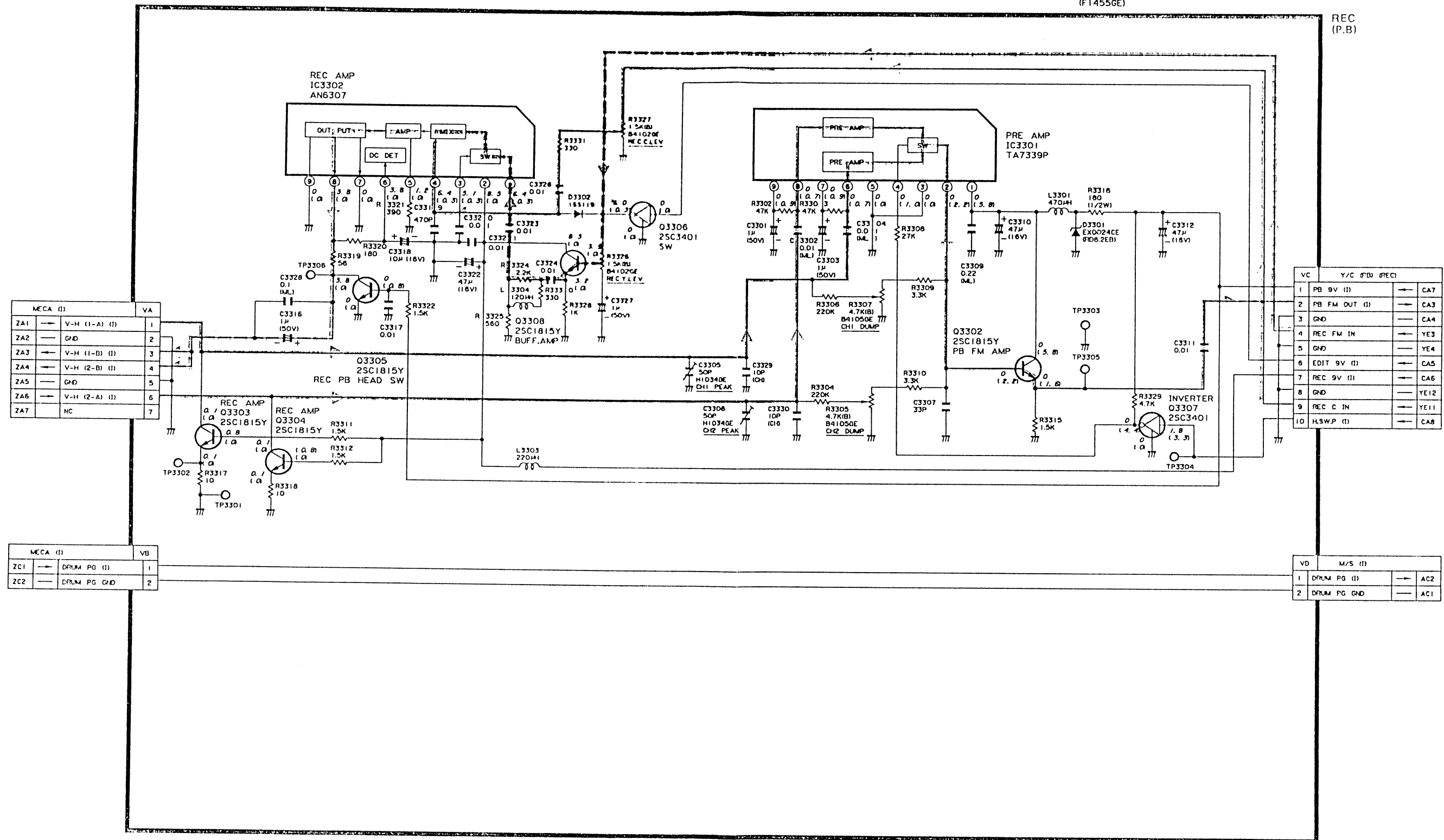
DUNTK1455HE50
(F1455GE)REC
(P.B)

Figure 65.

PWB-X, HEAD/RECORD AMPLIFIER CIRCUIT SCHEMATIC DIAGRAM (DECK-2)

NOTE: For Wiring Side PWB, refer to Fig. 81.

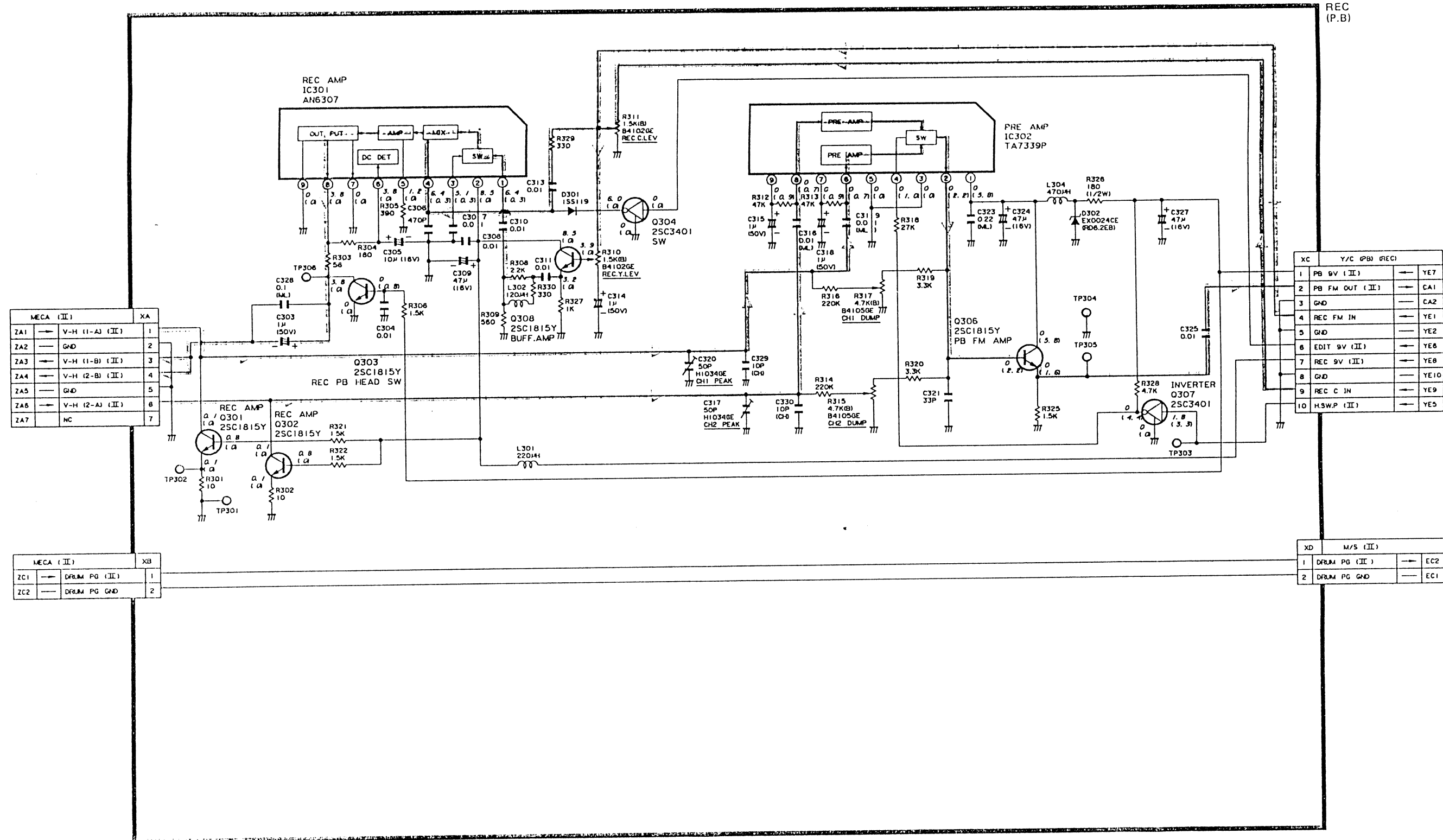
DUNTKI 456HE50
(F1456GE)REC
(P.B)

Figure 66.

PWB-T, TIMER/COUNTER CIRCUIT SCHEMATIC DIAGRAM

NOTE: For Wiring Side PWB, refer to Fig. 82.

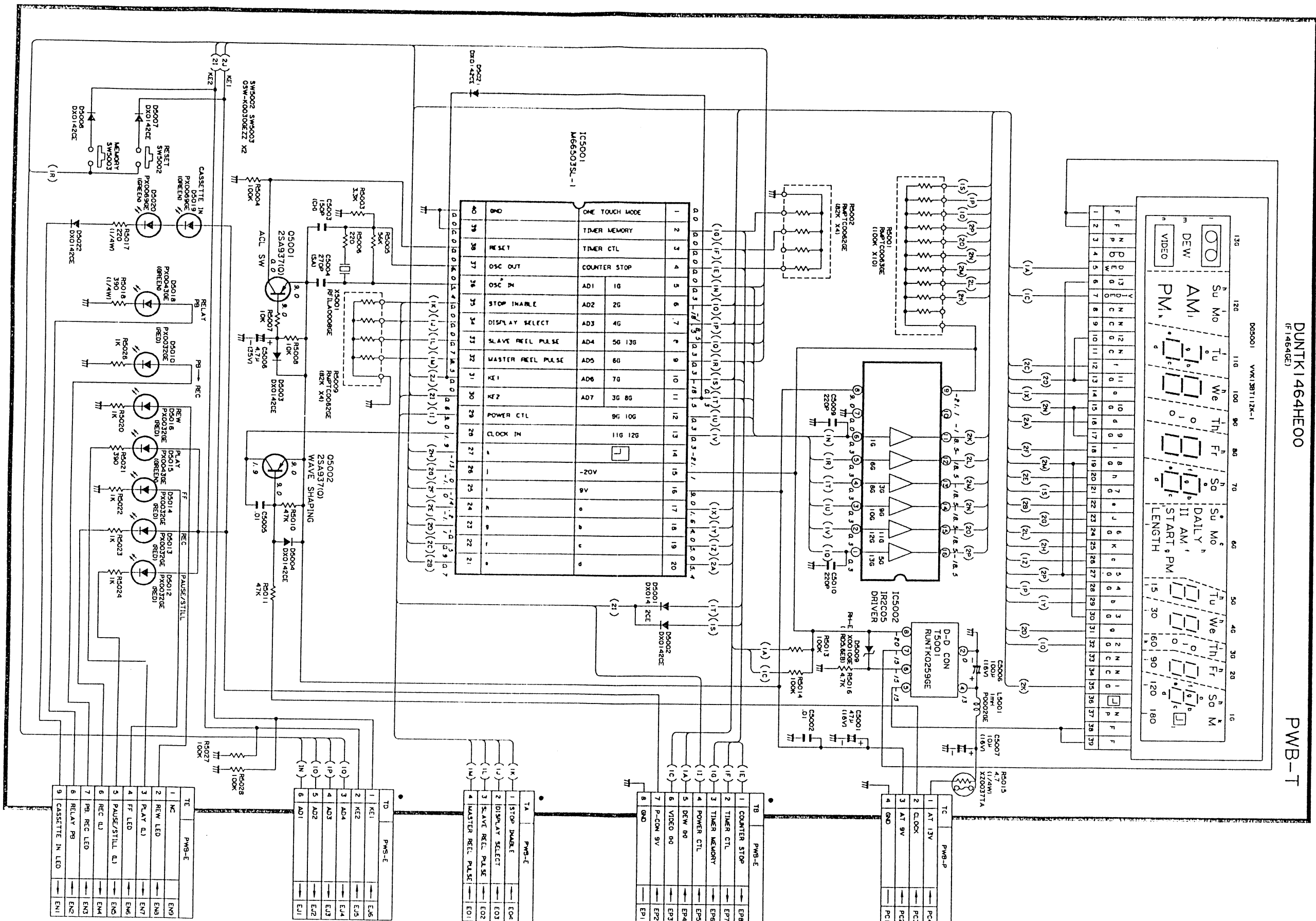


Figure 67.

POWER CIRCUIT SCHEMATIC DIAGRAM

NOTE: For Wiring Side PWB, refer to Page 87, 88.

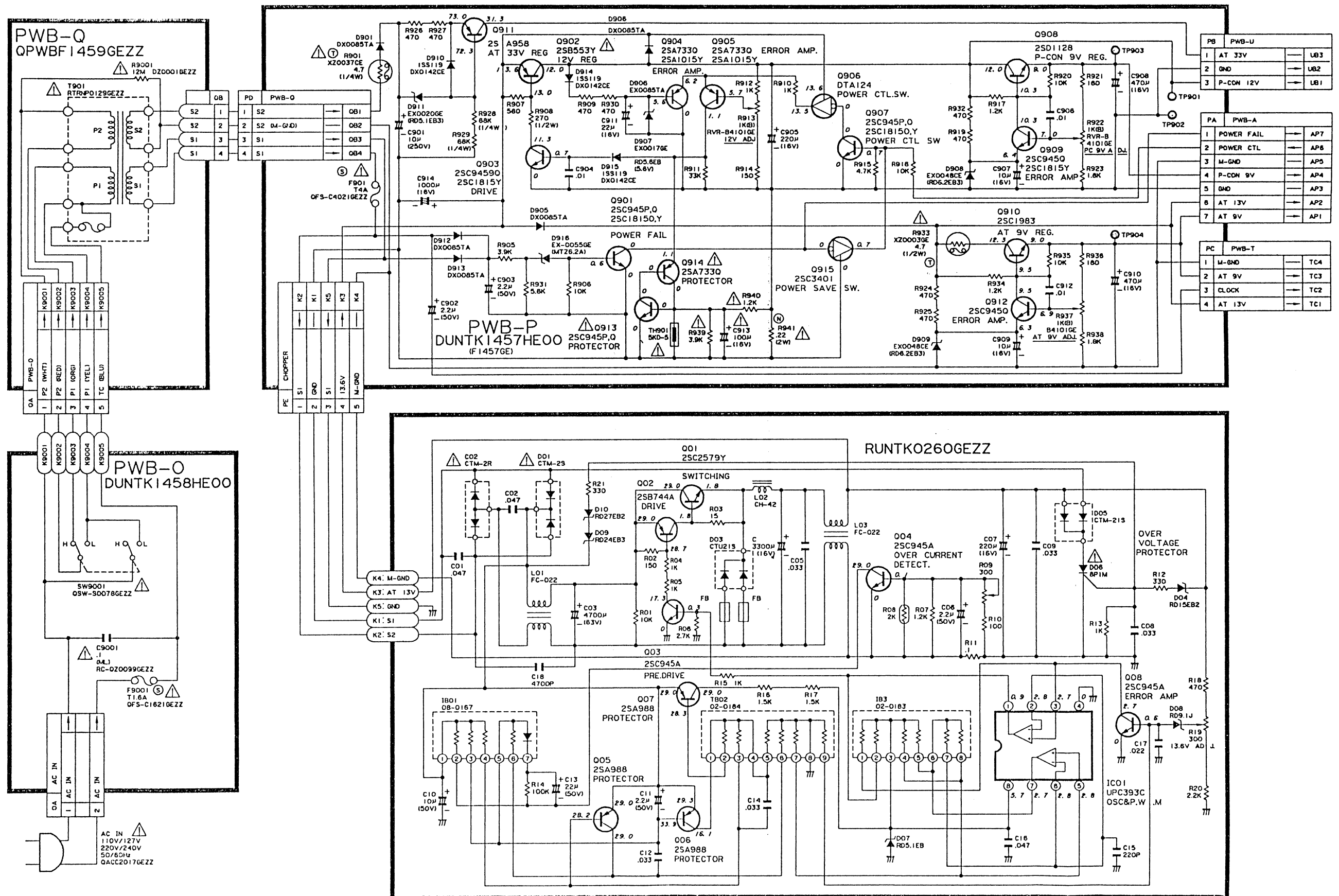


Figure 68.

TUNER SCHEMATIC DIAGRAM

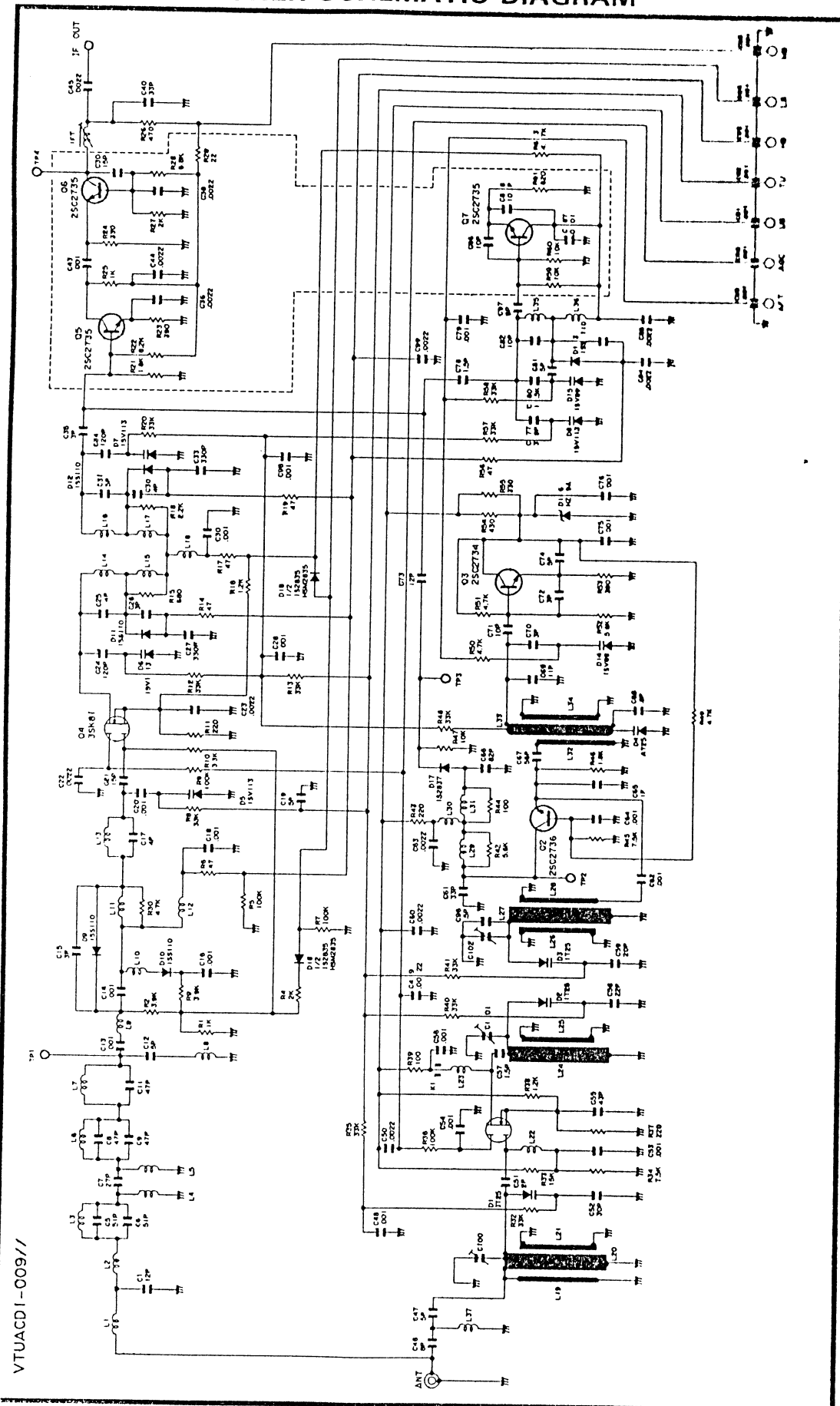


Figure 69.

CONVERTER SCHEMATIC DIAGRAM

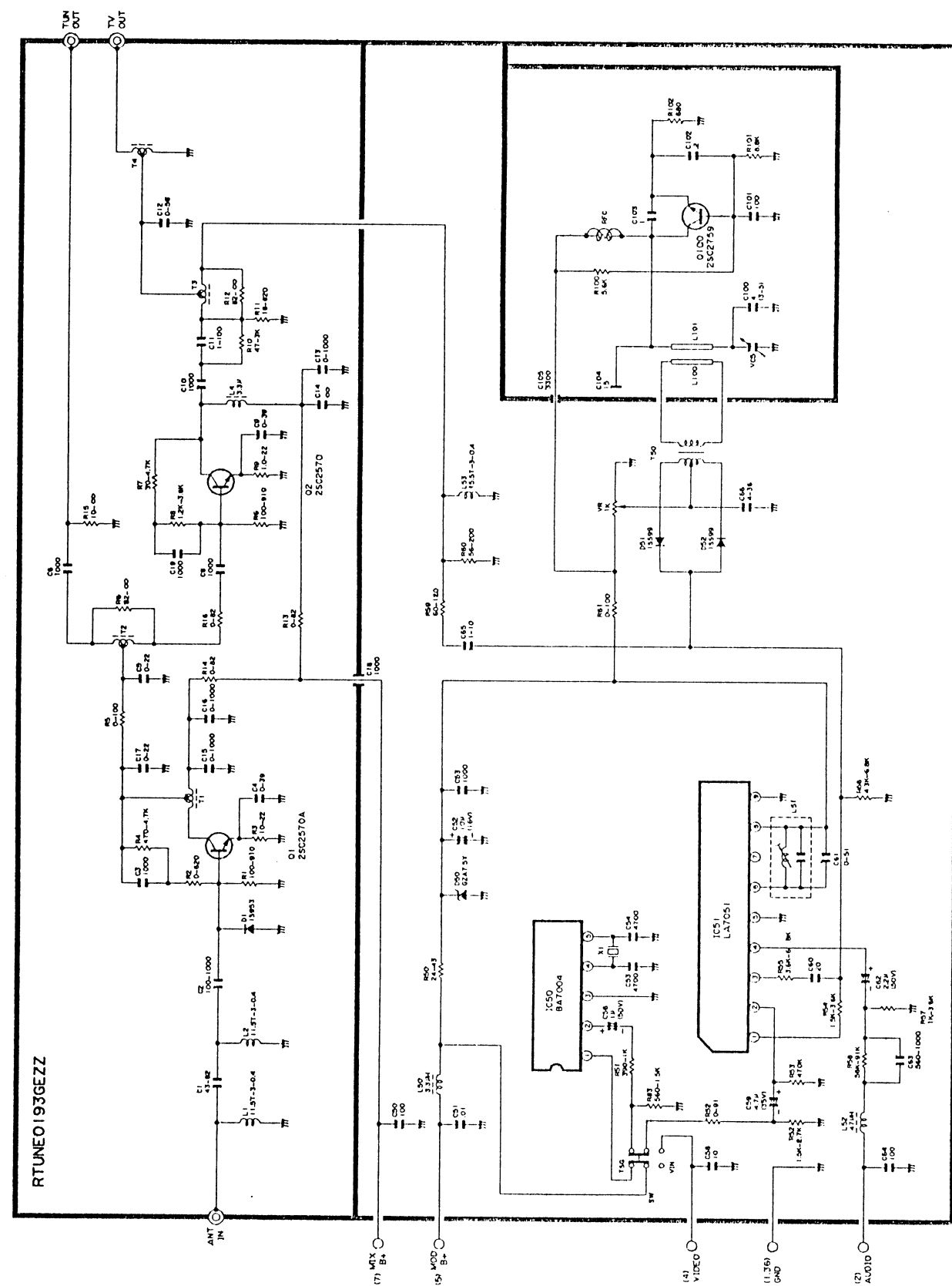
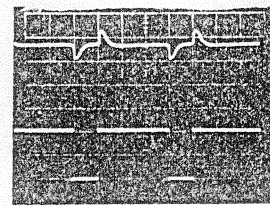


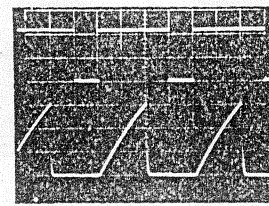
Figure 70.

PWB-A, SYSTEM CONTROL, SERVO CIRCUIT WIRING SIDE PWB (DECK-1)

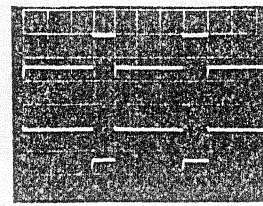
NOTE: For Schematic Diagram, refer to Fig. 57, 58.



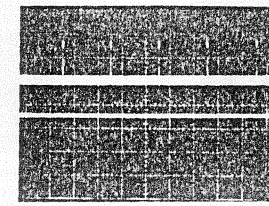
a) Control input signal
IC7001 20 pin
1V (DC)/Division 10m sec/Division
b) Control output pulse
IC7001 19 pin
2V (DC)/Division 10m sec/Division



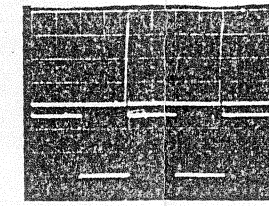
a) Control output pulse
IC7001 19 pin
2V (DC)/Division 10m sec/Division
b) Tracking monostable multi-vibrator pulse
IC7001 28 pin
1V (DC)/Division 10m sec/Division



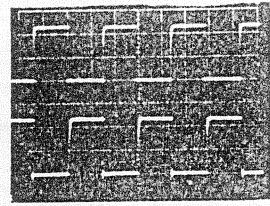
a) Control pulse (-)
IC7001 23 pin
1V (DC)/Division 10m sec/Division
b) Control pulse (+)
IC7001 23 pin
1V (DC)/Division 10m sec/Division



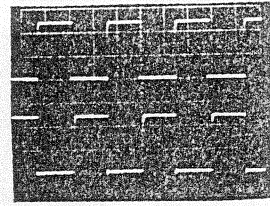
a) Vertical synchronizing pulse
IC7001 25 pin
0.5V (DC)/Division 10m sec/Division
b) Frame pulse
IC7001 27 pin
2.0V (DC)/Division



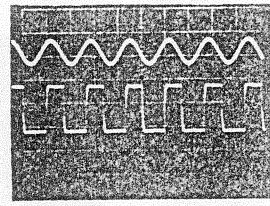
a) Channel-2 phase pulse
IC7001 30 pin
1V (DC)/Division 10m sec/Division
b) Head switching pulse (1)
IC7001 29 pin
1V (DC)/Division 10m sec/Division



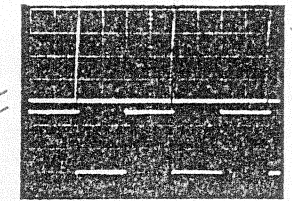
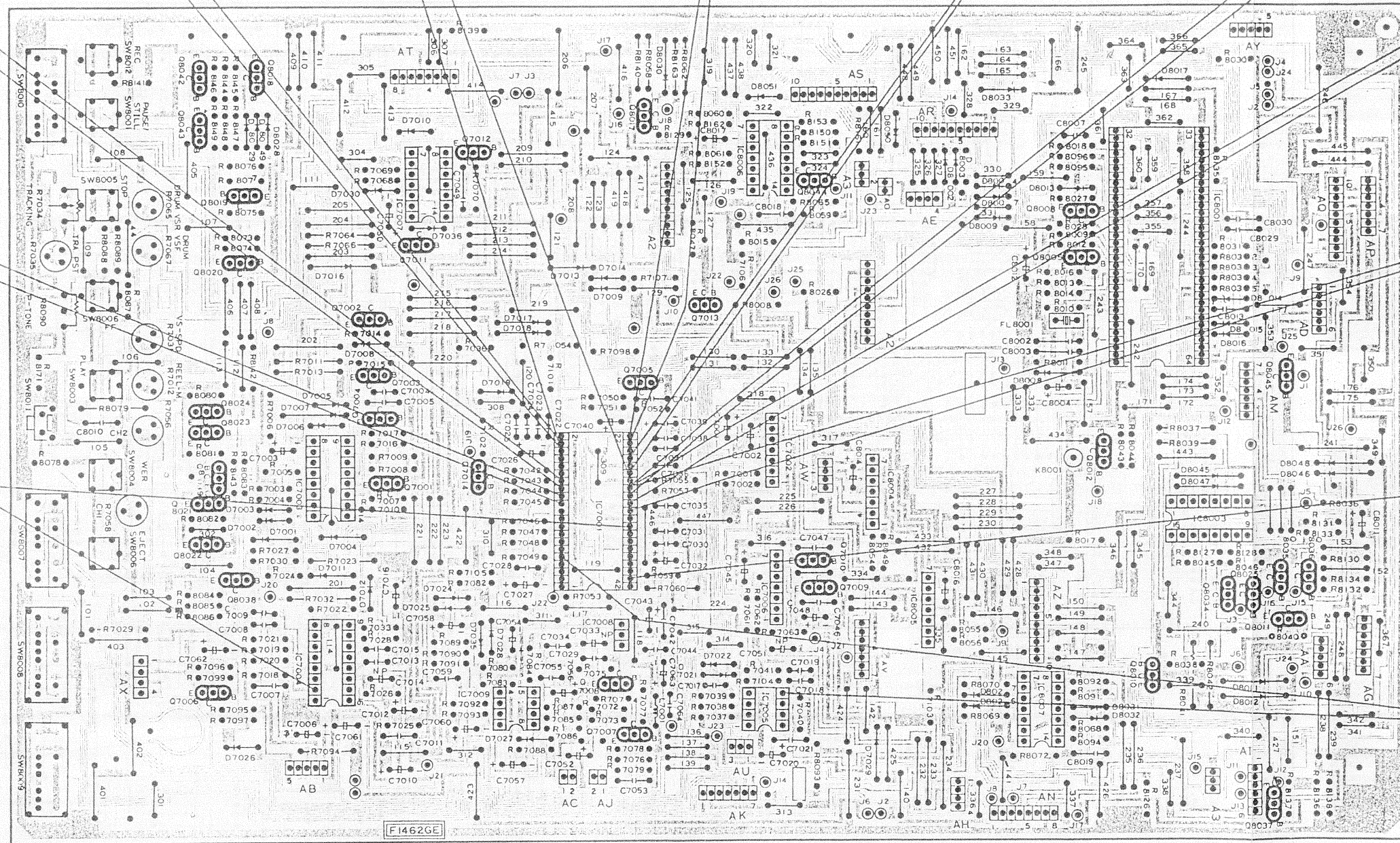
a) Capstan automatic phase control pulse
IC7001 13 pin
2V (DC)/Division 5m sec/Division
b) Capstan automatic frequency control pulse
IC7001 15 pin
2V (DC)/Division 5m sec/Division



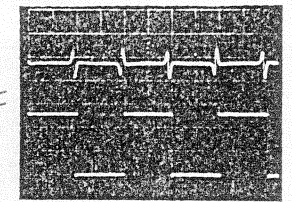
a) Drum automatic phase control pulse
IC7001 13 pin
2V (DC)/Division 5m sec/Division
b) Drum automatic frequency control pulse
IC7001 15 pin
2V (DC)/Division 5m sec/Division



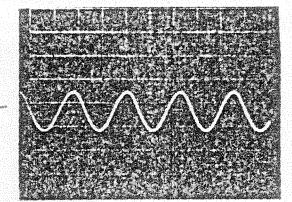
a) Drum frequency generator signal
IC7004 2 pin
50mV (AC)/Division 1m sec/Division
b) Drum frequency generator pulse
IC7001 34 pin
1V (DC)/Division 1m sec/Division



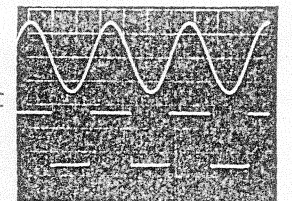
a) Channel-1 phase pulse
IC7001 31 pin
1V (DC)/Division 10m sec/Division
b) Head switching pulse (1)
IC7001 29 pin
1V (DC)/Division 10m sec/Division



a) Drum pulse generator signal
IC7001 32 pin
1V (DC)/Division 10m sec/Division
b) Head switching pulse (1)
IC7001 29 pin
1V (DC)/Division 10m sec/Division



4.43MHz oscillator signal
IC7001 41 pin
1V (DC)/Division 0.1m sec/Division



a) Capstan frequency generator signal
IC7005 5 pin
100mV (AC)/Division 1m sec/Division
b) Capstan frequency generator pulse
IC7001 5 pin
1V (DC)/Division 1m sec/Division

Figure 71.

PWB-E, SYSTEM CONTROL, SERVO CIRCUIT WIRING SIDE PWB (DECK-2)

NOTE: For Schematic Diagram, refer to Fig. 59, 60.

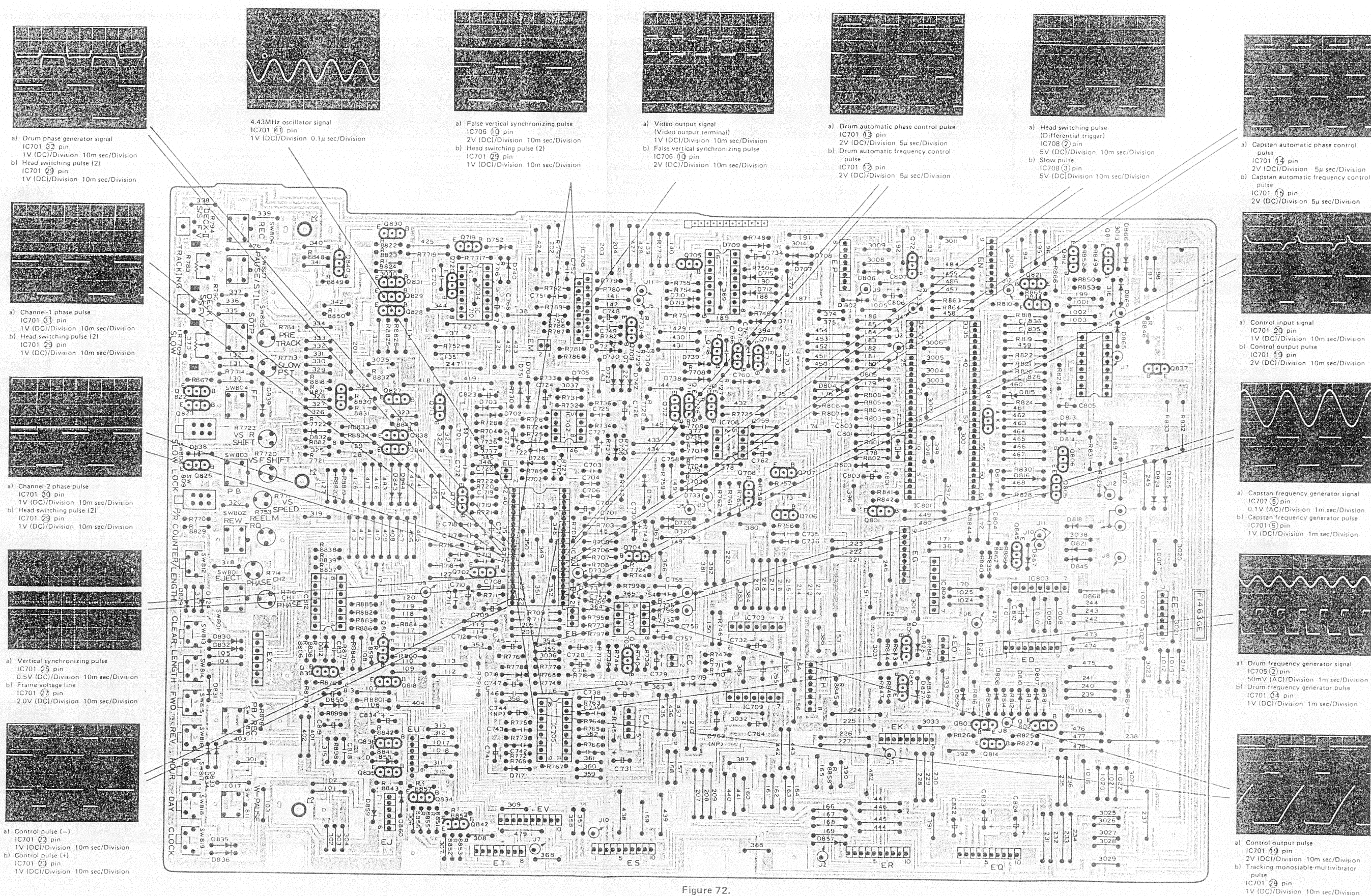
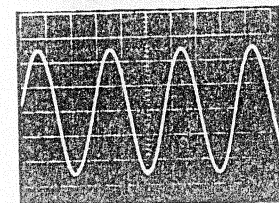


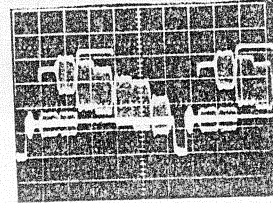
Figure 72.

PWB-C, Y/C CIRCUIT WIRING SIDE PWB (DECK-1)

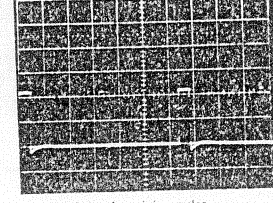
NOTE: For Schematic Diagram, refer to Fig. 61.



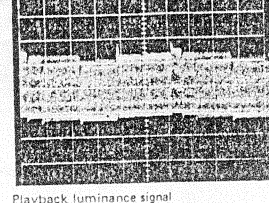
Bias oscillator signal
T601 (6) pin
20V (AC)/Division 5μ sec/Division



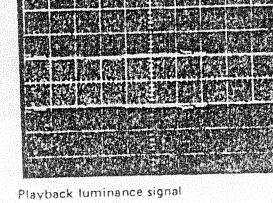
Video output signal
Connector CJ (1) pin
0.5V (AC)/Division 10μ sec/Division



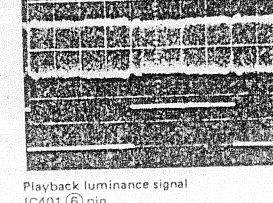
Horizontal synchronizing pulse
IC402 (1) pin
5V (DC)/Division 10μ sec/Division



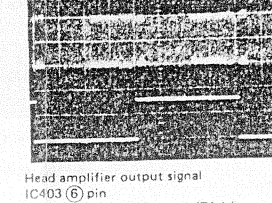
Playback luminance signal
IC402 (9) pin
0.5V (AC)/Division 10μ sec/Division



Playback luminance signal
Q405 emitter
0.5V (AC)/Division 10μ sec/Division



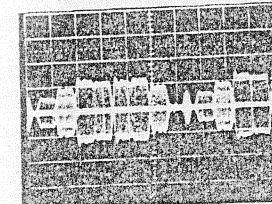
Playback luminance signal
IC401 (6) pin
0.5V (AC)/Division 5μ sec/Division



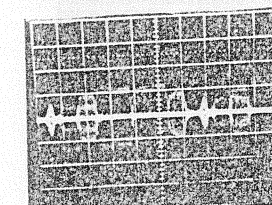
Head amplifier output signal
IC403 (6) pin
0.1V (AC)/Division 5μ sec/Division



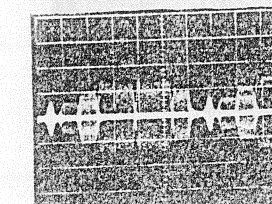
C-signal (Dubbing output)
Connector CK (1) pin
0.1V/Division 10μ sec/Division



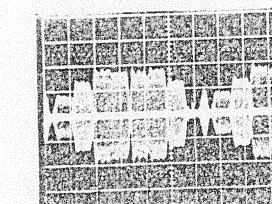
Playback chrominance signal
IC503 (9) pin
0.1V (AC)/Division 10μ sec/Division



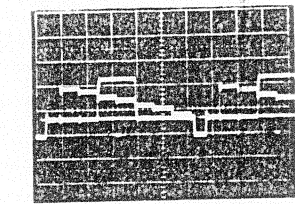
Playback chrominance signal
Q503 emitter
0.1V (AC)/Division 10μ sec/Division



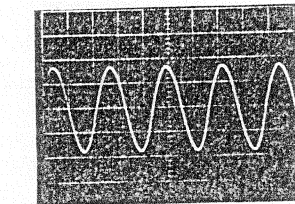
Playback chrominance signal
IC501 (25) pin
0.1V/Division 10μ sec/Division



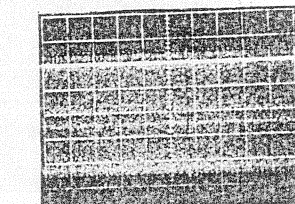
Playback chrominance signal
IC501 (22) pin
0.2V (AC)/Division 10μ sec/Division



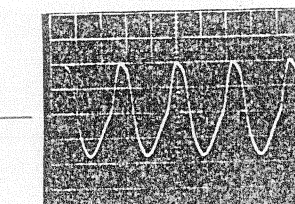
Playback luminance signal
Q409 emitter
0.5V (AC)/Division 10μ sec/Division



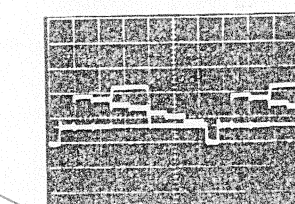
Servo clock (2) signal
TP501
2V (AC)/Division 0.1μ sec/Division



Playback chrominance signal
TP505
0.2V (AC)/Division 10μ sec/Division



4.43MHz output signal
TP503
0.2V (AC)/Division 0.1μ sec/Division



Luminance signal (Dubbing output)
Connector CI (1) pin
0.2V (AC)/Division 10μ sec/Division

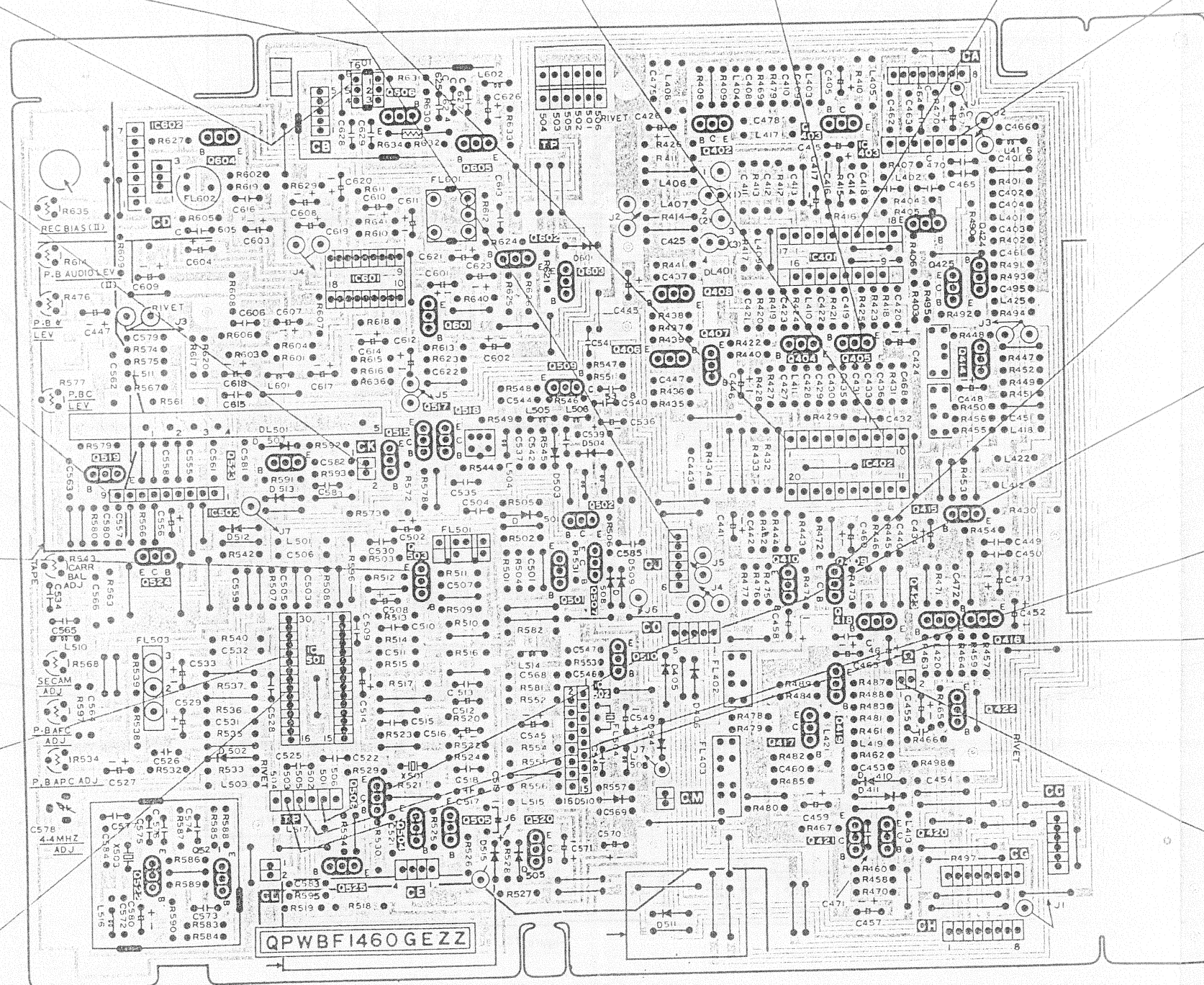


Figure 73.

PWB-Y, Y/C CIRCUIT WIRING SIDE PWB (DECK-2) NOTE: For Schematic Diagram, refer to Fig. 62.

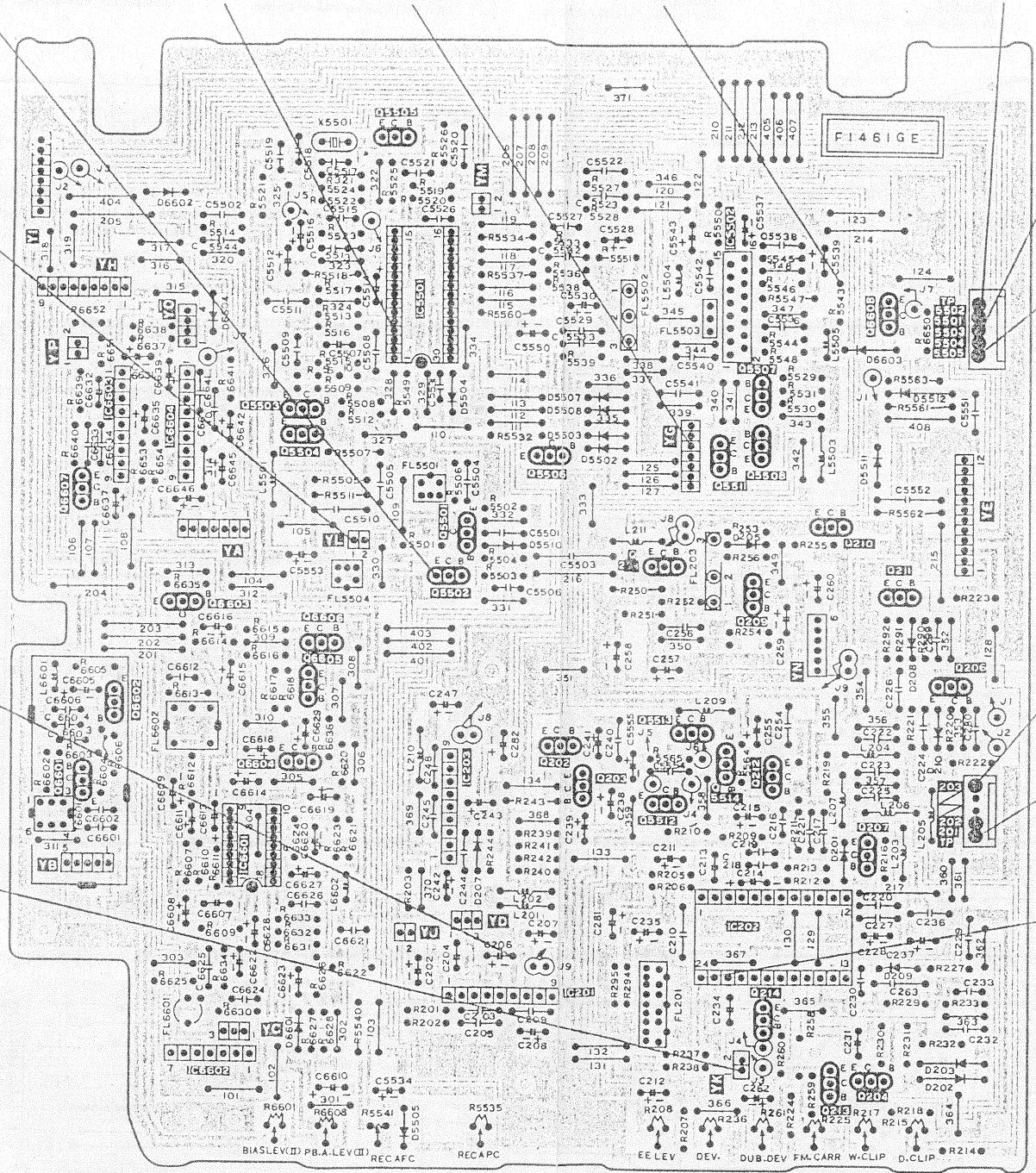
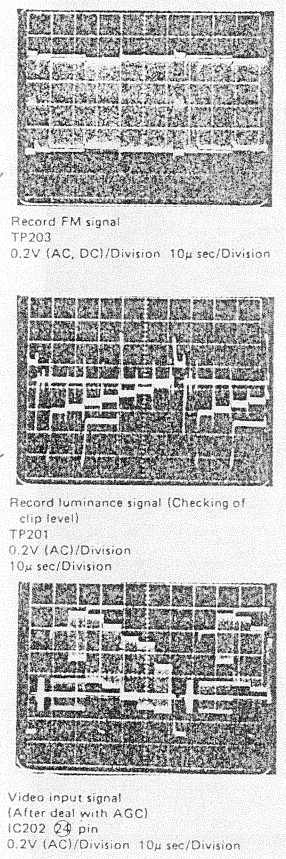
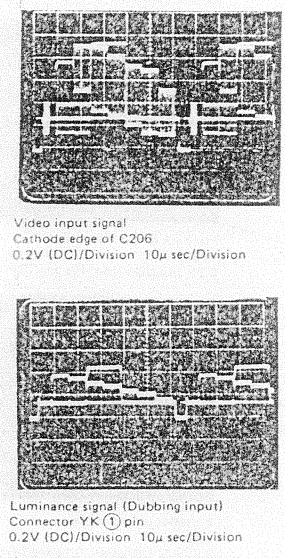
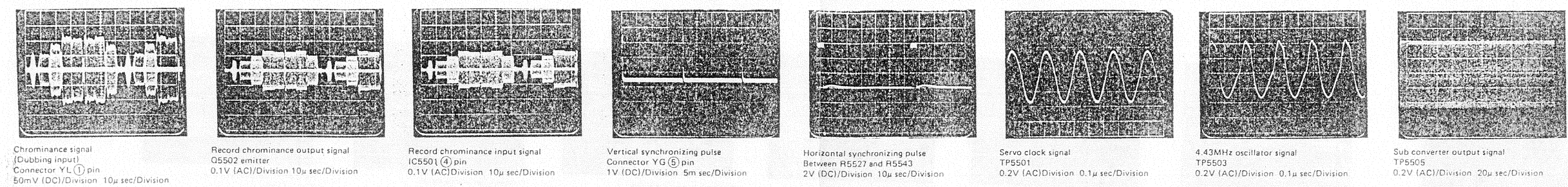
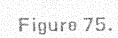
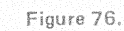


Figure 74.

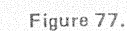
NOTE: For Schematic Diagram, refer to Fig. 63.



NOTE: For Schematic Diagram, refer to Fig. 63.



NOTE: For Schematic Diagram, refer to Fig. 63.



PWB-G, SUB SERVO/MECHANICAL CONTROL CIRCUIT WIRING SIDE PWB (DECK-1)

NOTE: For Schematic Diagram, refer to Fig. 65.

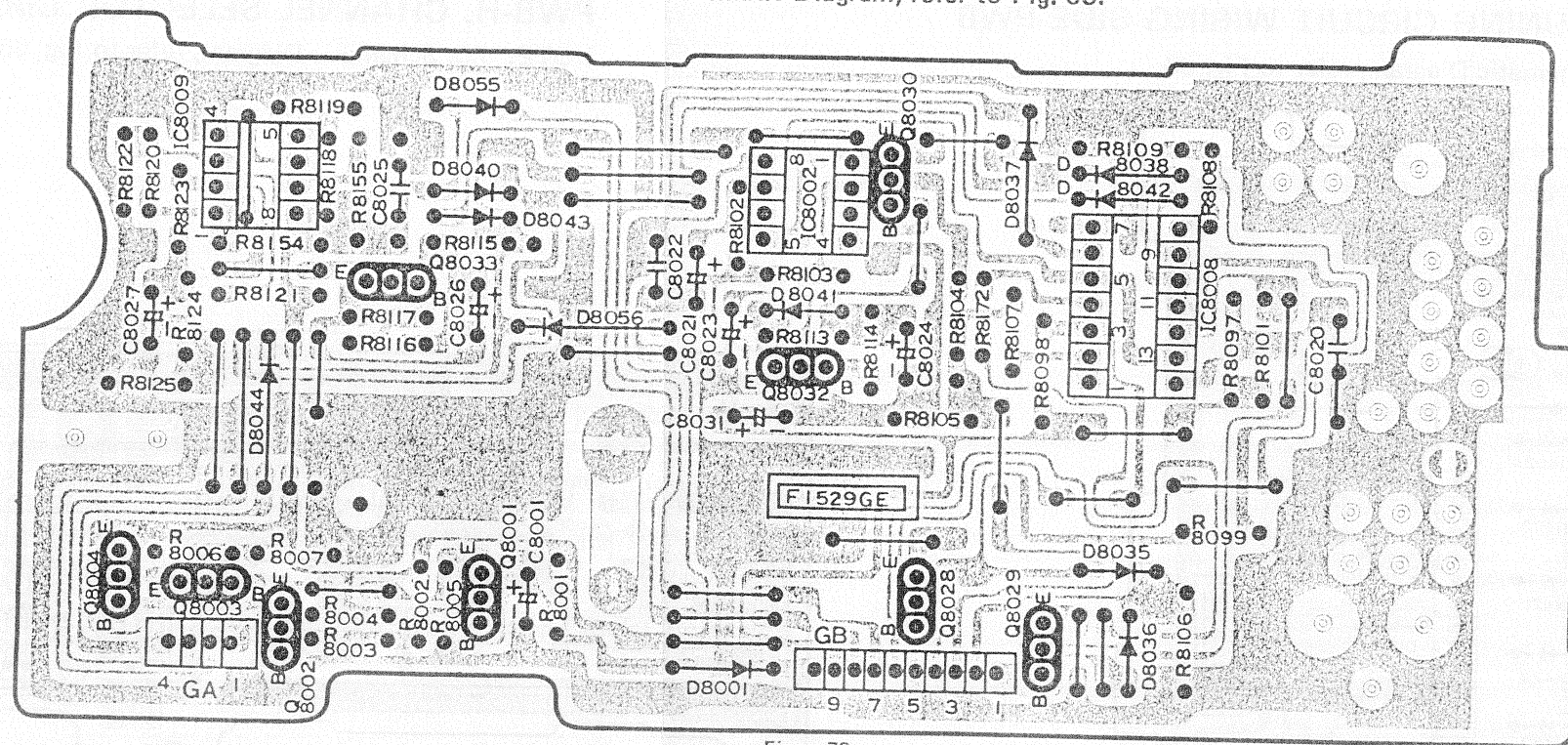


Figure 78.

PWB-D, SUB SERVO/MECHANICAL CONTROL CIRCUIT WIRING SIDE PWB (DECK-2

PWB-V, HEAD/RECORD AMPLIFIER CIRCUIT WIRING SIDE PWB (DECK-1)

NOTE: For Schematic Diagram, refer to Fig. 65.

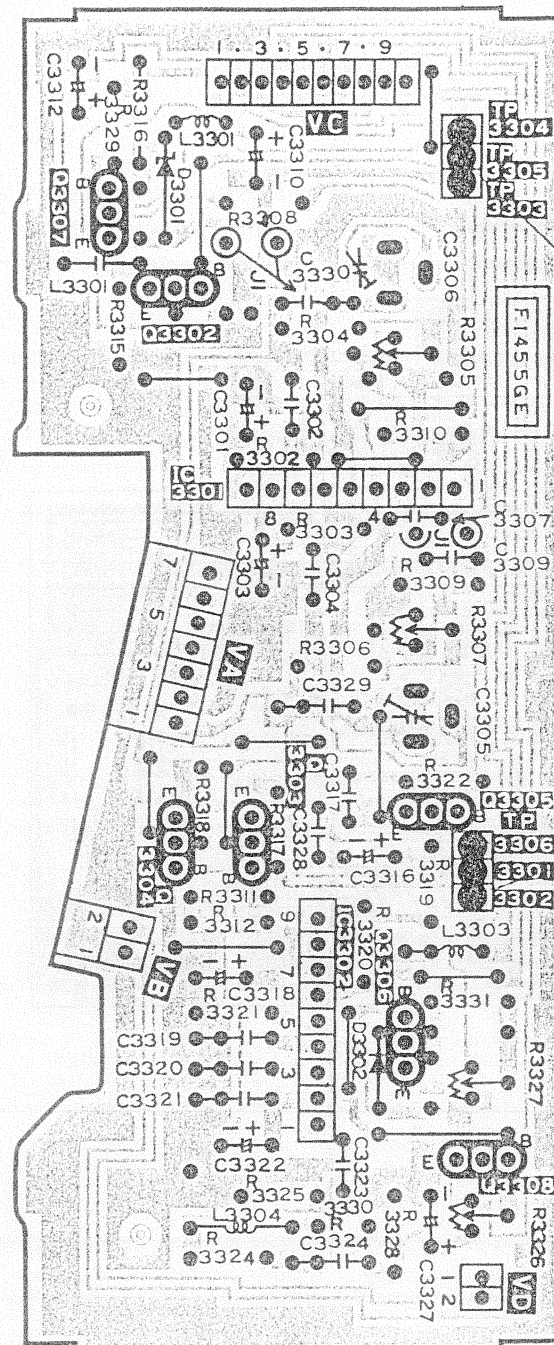
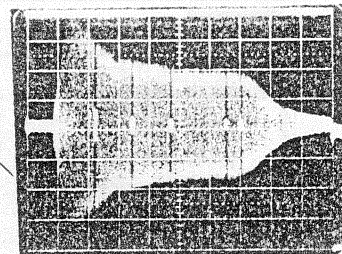
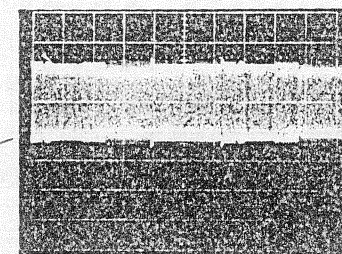


Figure 80.



Radio frequency sweep tape signal
(for 3 hours)
Deck (1) channel-2
TP3305
50mV (AC)/Division 2m sec/Division
— Externally trigger with Head
switching pulse —



Head amplifier record current
TP3302
50mV (DC)/Division 10μ sec/Division

PWB-X, HEAD/RECORD AMPLIFIER CIRCUIT WIRING SIDE PWB (DECK-2)

NOTE: For Schematic Diagram, refer to Fig. 66.

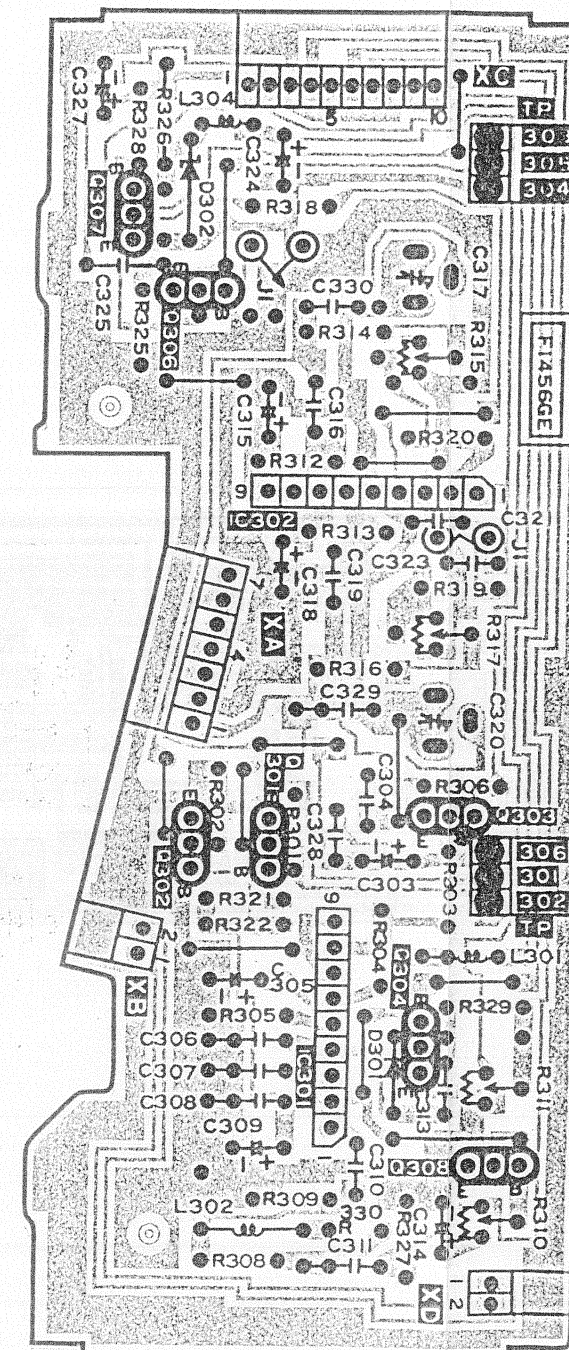


Figure 81.

NOTE: For Schematic Diagram, refer to Fig. 67.

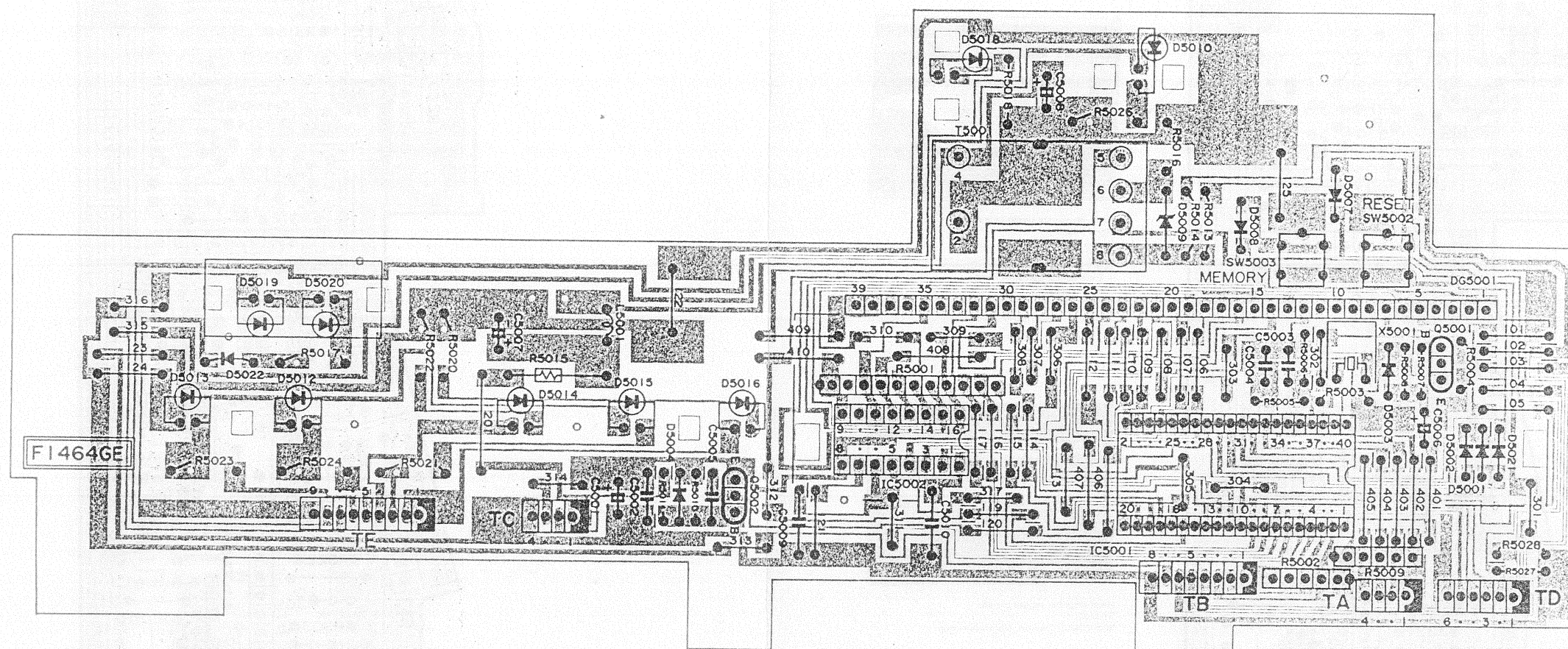


Figure 82.

POWER CIRCUIT WIRING SIDE PWB

NOTE: For Schematic Diagram refer to Page 67, 68.

PWB-O

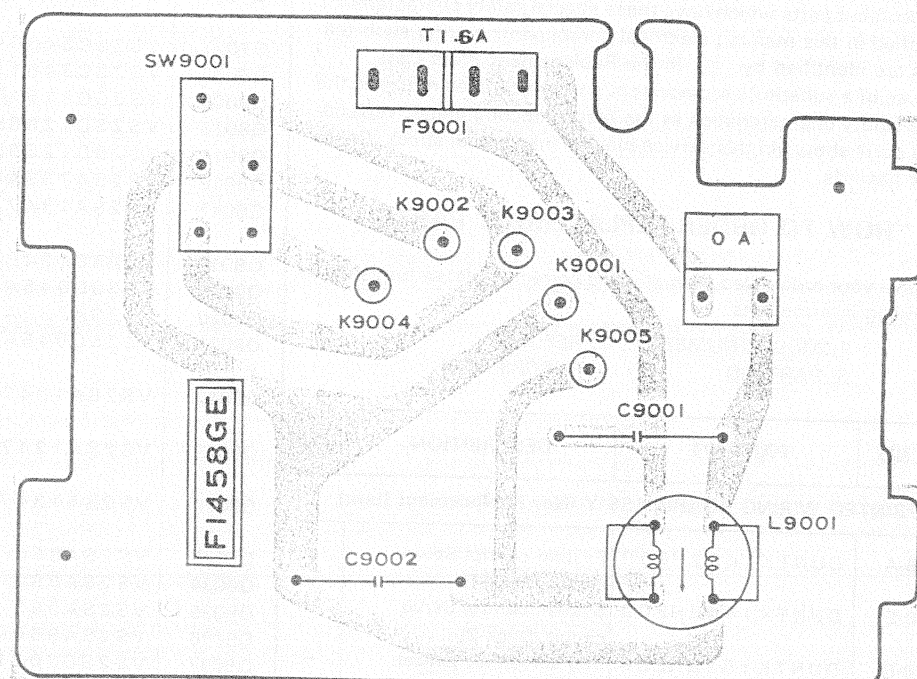


Figure 83.

PWB-P

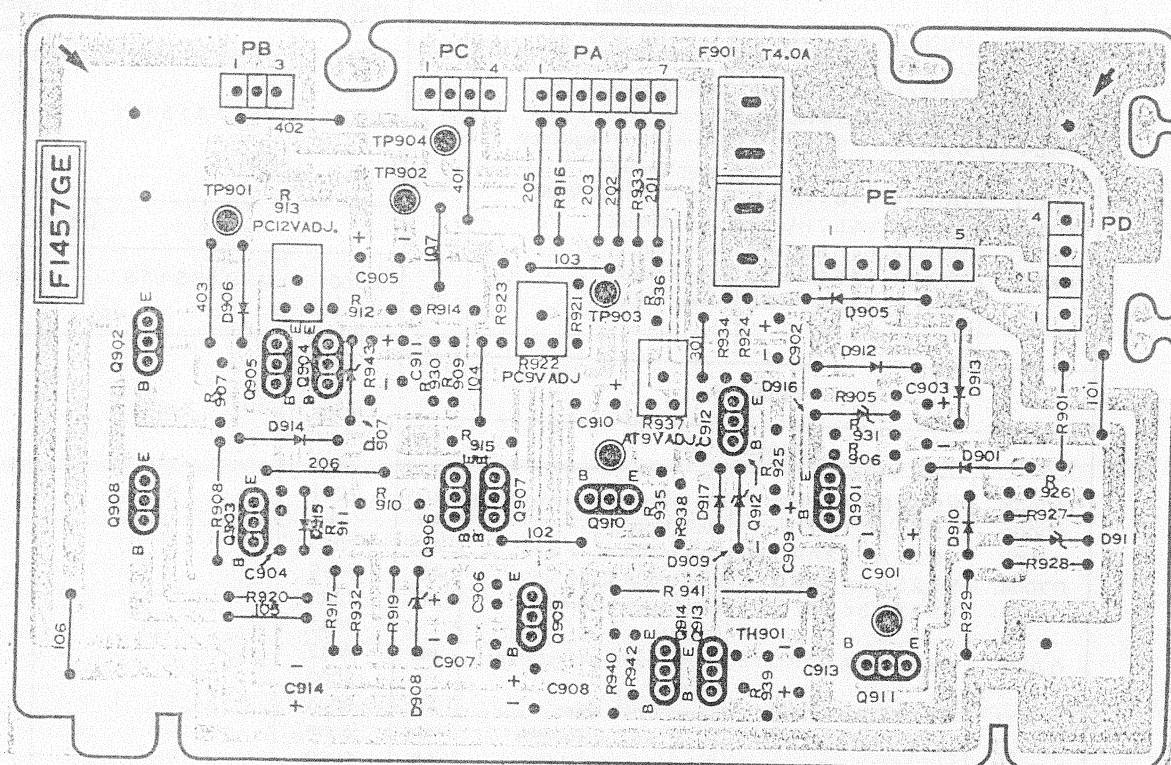


Figure 84.

SCHEMATIC DIAGRAM

IMPORTANT SAFETY NOTICE:

BE SURE TO USE GENUINE PARTS FOR SECURING THE SAFETY AND RELIABILITY OF THE SET.

PARTS MARKED WITH "△" AND PARTS SHADED (IN BLACK) ARE ESPECIALLY IMPORTANT FOR MAINTAINING THE SAFETY AND PROTECTING ABILITY OF THE SET.

BE SURE TO REPLACE THEM WITH PARTS OF SPECIFIED PART NUMBER.

SAFETY NOTES:

1. DISCONNECT THE AC PLUG FROM THE AC OUTLET BEFORE REPLACING PARTS.
2. SEMICONDUCTOR HEAT SINKS SHOULD BE REGARDED AS POTENTIAL SHOCK HAZARDS WHEN THE CHASSIS IS OPERATING.

NOTES:

1. The unit of resistance "ohm" is omitted ($k = 1000 \text{ ohm}$, $M = 1 \text{ Meg ohm}$).
2. All resistors are $1/8$ watt, unless otherwise noted.
3. The unit of capacitance "F" is omitted ($\mu = \mu F$, $p = pF$).

VOLTAGE MEASUREMENT CONDITIONS:

1. DC voltages are measured between points indicated and chassis ground by VTVM, with AC110/127/220/240 AUTO, 50/60Hz supplied to unit and all controls are set to normal viewing picture unless otherwise noted.
2. Voltages are measured with $10000 \mu V$ B & W or colour signal.

WAVEFORM MEASUREMENT CONDITIONS:

$10000 \mu V$ 87.5 percent modulated colour bar signal is fed into tuner.

CAUTION:

This circuit diagram is original one. Therefore there may be a slight difference from yours.

POWER CIRCUIT WIRING SIDE PWB

NOTE: For Schematic Diagram, refer to Page 67, 68.

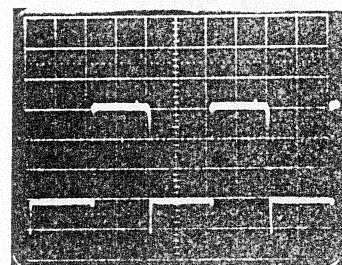
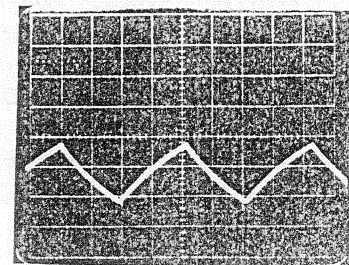
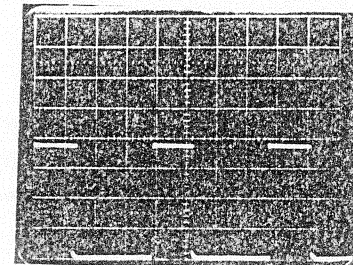
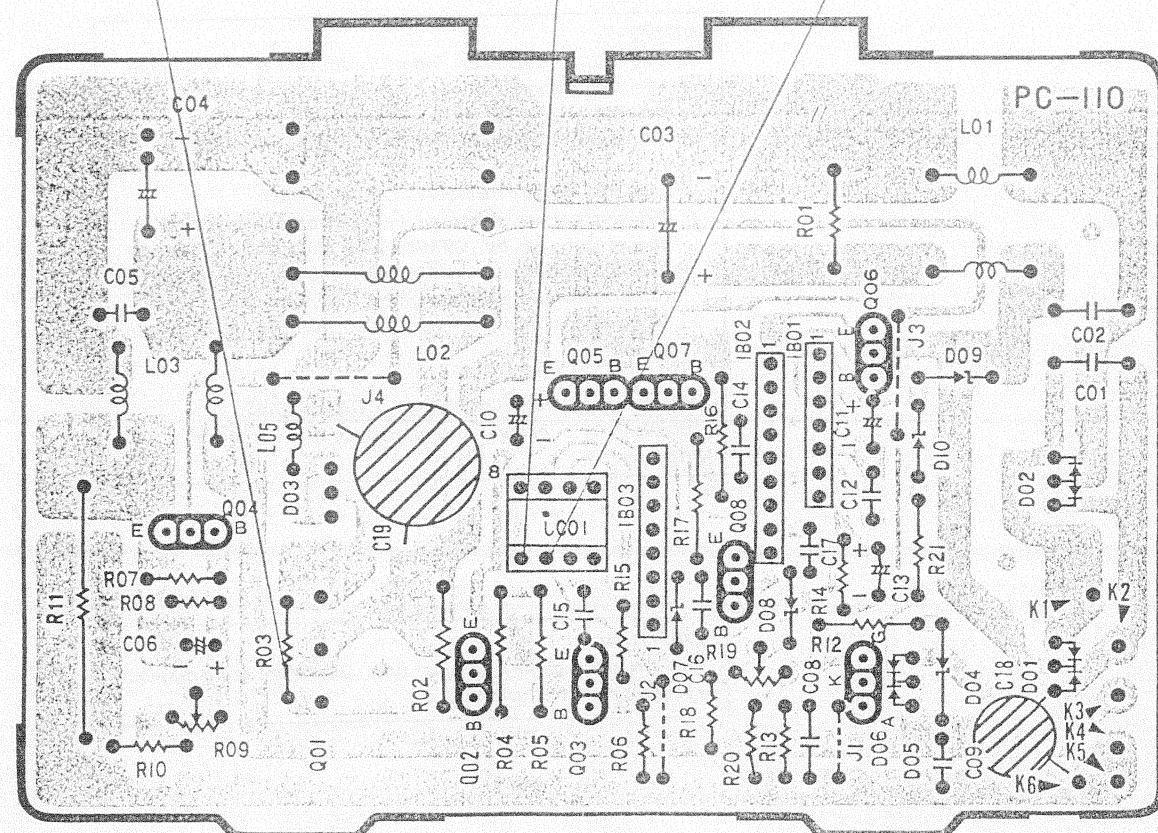
Switching pulse
Q01 emitter
10V (DC)/Division 10μ sec/DivisionSaw tooth wave
IC01 ① pin
0.5V (DC)/Division 10μ sec/DivisionSwitching pulse
IC01 ② pin
1V (DC)/Division 10μ sec/Division

Figure 85.

PARTS LIST

PARTS REPLACEMENT

Replacement parts which have these special safety characteristics identified in this manual; electrical components having such features are identified by Δ in the Replacement Parts Lists. The use of a substitute replacement part which does not have the same safety characteristics as the factory recommended replacement parts shown in this service manual may create shock, fire or other hazards.

"HOW TO ORDER REPLACEMENT PARTS"

To have your order filled promptly and correctly, please furnish the following informations.

1. MODEL NUMBER
2. REF. NO.
3. PART NO.
4. DESCRIPTION

REF. NO.	PART NO.	DESCRIPTION	CODE
PRINTED WIRING BOARD ASS'Y (Not Replacement Item)			
PWB-A	DUNTK1462HE00	System control Servo circuit (Deck-1)	—
PWB-E	DUNTK1463HE00	System control Servo circuit (Deck-2)	—
PWB-G	DUNTK1529HE00	Sub servo/mechanical control circuit (Deck-1)	—
PWB-D	DUNTK1528HE00	Sub servo/mechanical control circuit (Deck-2)	—
PWB-V	DUNTK1455HE50	Head/Record amplifier circuit (Deck-1)	—
PWB-X	DUNTK1456HE50	Head/Record amplifier circuit (Deck-2)	—
PWB-C	DUNTK1460HE00	Y/C circuit (Deck-1)	—
PWB-Y	DUNTK1461HE00	Y/C circuit (Deck-2)	—
PWB-H	DUNTK1465HE00	Channel selector circuit	—
PWB-U	DUNTK1454HE00	Channel tuning circuit	—
PWB-I	DUNTK1453HE00	Intermediate frequency tuning circuit	—
PWB-T	DUNTK1464HE00	Timer/Counter circuit	—
PWB-P	DUNTK1457HE00	Power circuit	—
PWB-O	DUNTK1458HE00	Power circuit	—
PWB-Q	QPWBF1355GEZZ	Power circuit	—
	RUNTK0260GEZZ	Power circuit	—

PWB-A

TRANSISTORS

Q7001	VS2SB772-PQ-1	Unloading torque switching	AD
Q7002	VS2SA1347/-1	Switching	AB
Q7003	VS2SA733APQ1E	Reel motor drive amp.	AC
Q7004	VS2SC945APQ1E	Reel motor drive amp.	AB
Q7005	VS2SC3400/-1	Head switching pulse inverter	AB
Q7006	VS2SC945APQ1E	Drum motor rush current limiter	AB
Q7007	VS2SC945APQ1E	Servo clock amp.	AB
Q7008	VS2SC945APQ1E	Drum pulse generator	AB
Q7009	VS2SC945APQ1E	Capstan motor drive	AB
Q7010	VS2SD882-PQ-1	Capstan motor drive	AD

REF. NO.	PART NO.	DESCRIPTION	CODE
Q7011	VS2SA1347/-1	Drum video search reverse switching	AB
Q7012	VS2SC3401/-1	Drum video search forward switching	AD
Q7013	VS2SC3401/-1	Vertical synchronization muting	AD
Q7021	VS2SC3400/-1	Muting, Edit	AB
Q8005	VS2SC3401/-1	Muting, Sensor	AD
Q8008	VS2SC945APQ1E	Inverter (Reel pulse)	AB
Q8010	VS2SD1286LK-1	Supply reel brake	AE
Q8011	VS2SD1286LK-1	Take-up reel brake	AE
Q8012	VS2SA733APQ1E	Cassette down 9V	AC
Q8017	VS2SA1347/-1	Switching (Playback 2 key pulse)	AB
Q8018	VS2TC124F/-1	Playback/Record lock mute	AB
Q8019	VS2SC945APQ1E	Switching	AB
Q8020	VS2SA733APQ1E	Switching	AC
Q8021	VS2SC945APQ1E	Switching (Playback 1 key pulse (Low))	AB
Q8022	VS2SA1347/-1	Switching (Playback 1 key pulse)	AB
Q8023	VS2SA1347/-1	Switching (Pause/Still key pulse)	AB
Q8024	VS2SA1347/-1	Switching (Playback 1 key pulse)	AB
Q8025	VS2SA950-Y/1E	Playback, 9V (1)	AD
Q8034	VS2SA950-Y/1E	Record, 9V (1)	AD
Q8035	VS2SA950-Y/1E	Playback, 9V	AD
Q8036	VS2SA950-Y/1E	Record, 9V	AD
Q8037	VS2SC2021-Q-1	Bias control buffer	AB
Q8038	VS2SA1347/-1	Switching (Record 1 key pulse)	AB
Q8039	VS2SC945APQ1E	Switching (Record 1 key pulse (Low))	AB
Q8042	VS2SC2021-Q-1	Switching (Record 1 key Mute)	AB
Q8043	VS2SC2021-Q-1	Switching (Playback 1 key Mute)	AB
Q8044	VS2SA1347/-1	Switching (Video muting, High)	AB
Q8045	VS2SA1346/-1	Playback, 9V (Video, High)	AB
DIODES			
D7001	VHD1SS119/-1	Diode (1SS119)	AB
7014,			
7016			
7019,			
7021,			
7022,			
7024			
7030,			
7035,			
7036,			
7041,			
7042,			
8002,			
8004,			
8008,			
8009			

REF.NO.	PART NO.	DESCRIPTION	CODE	REF. NO.	PART NO.	DESCRIPTION	CODE
D8011, 8012	VHDERB1201/-1	Diode (ERB1201)	AB	R7065,	RVR-M7143TAZZ	220K ohm, Pot., Drum motor Video search shift reverse adj.	AC
D8013	VHD1SS119/-1	Diode (1SS119)	AB	R7067	RVR-M7141TAZZ	1M ohm, Pot., Drum motor Video search shift forward adj.	AC
D8014	RH-EX0042TAZZ	Zener diode (RD4.7EB3)	AB	R8090	RVR-B4260GEZZ	10K ohm, Pot., Picture-tone adj.	AD
D8015	VHD1SS119/-1	Diode (1SS119)	AB	COIL AND FILTER			
8017, 8028, 8031, 8032, 8043, 8045				L7001	VP-LK221K0000	220μH	AC
8049, 8061, 8062				FL8001	RFILC0003AEZZ	Filter (400KHz)	AE
INTEGRATED CIRCUITS				CAPACITORS			
IC7001	RH-iX0107GEZZ	Drum/Capstan servo	AZ	C7014	VCE9AA1HW105M	1μF, 50V, Electrolytic (nonpolar)	AB
IC7002	VHiTA7267P/-1	Reel motor forward/reverse switching	AL	C7016	VCEAEA1CW107M	100μF, 16V, Electrolytic	AC
IC7003	VHiUPA81C/-1	Inverter (Reel mode switching)	AF	C7033	VCE9AA1HW105M	1μF, 50V, Electrolytic (nonpolar)	AB
IC7004	VHiBA6303/-1	Reel motor video search control	AK	C7045	RC-EZ0025GEZZ	470μF, 16V, Electrolytic	AC
IC7005	VHiR94558/-1	Capstan frequency generator amp./playback control pulse amp.	AF	C7050	VCSATA1CE335K	3.3μF, 16V, Tantalum	AC
IC7006	VHiTA7267P/-1	Capstan motor forward/reverse switching	AL	C7051	VCE9AA1HW476M	47μF, 16V, Electrolytic (nonpolar)	AC
IC7007	VHiTC4011BP-1	Video search drum shift control	AF	C7054	VCEAEA1CW107M	100μF, 16V, Electrolytic	AC
IC7008	VHiAN78N05/-1	5V Regulator	AF	C7057	RC-EZ0025GEZZ	470μF, 16V, Electrolytic	AC
IC7009	VHiR94558/-1	Capstan motor AFC/APC adder, Drum motor AFC/APC adder	AF	C7061	RC-EZ0025GEZZ	470μF, 16V, Electrolytic	AC
IC8001	RH-iX0096GEZZ	System controller	AY	C7063	VCEAEA1CW107M	100μF, 16V, Electrolytic	AC
IC8003	VHiR2403/-1	Buffer (Inverter)	AK	C8009	RC-EZ0025GEZZ	470μF, 16V, Electrolytic	AC
IC8004	VHiTA7267P/-1	Cassette motor forward/reverse switching	AL	RESISTORS			
IC8005	VHiTA7267P/-1	Loading motor forward/reverse switching	AL	R8041,	VRS-VV3DB390J	39 ohm, 2W, 5%, Metal oxide film	AA
IC8006	VHiHD14023P-1	Logic element	AE	8042			
IC8007	VHiTC4081BP-1	Playback/Record Head switching pulse generator	AF	MISCELLANEOUS			
CONTROLS				SW8001,	QSW-K0030GEZZ	Pause/Still switch	AB
R7012	RVR-M7133TAZZ	4.7K ohm, Pot., Reel motor torque shift adj.	AC	8002,		Fast forward switch	
R7031	RVR-M7141TAZZ	100K ohm, Pot., Video search speed control	AC	8003,		Playback (1) switch	
R7034	RVR-B4084GEZZ	200K ohm, Pot., Tracking adj.	AD	8004,		Rewind switch	
R7035	RVR-B7054TAZZ	47K ohm, Pot., Tracking pre-set adj.	AD	8005,		Stop switch	
R7056,	RVR-M7141TAZZ	100K ohm, Pot., Channel-2 Phase adj.	AC	8006		Ejection switch	
7058		100K ohm, Pot., Channel-1 Phase adj.		SW8007,	QSW-S0075GEZZ	Record system switch	AF
				8008		Playback system switch	
				SW8009,	QSW-S0076GEZZ	Input selection switch	AF
				8010		Relay playback switch	
				SW8011	QSW-K0014CEZZ	E-E monitor switch	AC
				SW8012	QSW-K0030GEZZ	Record (1) switch	AB
				AB	QPLGN0557GEZZ	Plug (5 pin)	AB
				AG	QPLGN0757GEZZ	Plug (7 pin)	AB
				AI	QPLGN0652GEZZ	Plug (6 pin)	AB
				AJ	QPLGN0257GEZZ	Plug (2 pin)	AA
				AK,	QPLGN0752GEZZ	Plug (7 pin)	AB
				AM			
				AN	QPLGN0852GEZZ	Plug (8 pin)	AC
				AO	QPLGN0257GEZZ	Plug (2 pin)	AC
				AP	QPLGN0757GEZZ	Plug (7 pin)	AB
				AQ	QPLGN1052GEZZ	Plug (10 pin)	AC
				AR, AS	QPLGN1052GEZZ	Plug (10 pin)	AC

REF.NO.	PART NO.	DESCRIPTION	CODE	REF. NO.	PART NO.	DESCRIPTION	CODE
AT	QPLGN0852GEZZ	Plug (8 pin)	AC	Q835	VS2SC3400/-1	Switching (Counter switching)	AB
AU	QPLGN0357GEZZ	Plug (3 pin)	AB	Q836	VS2SC3401/-1	Switching	AD
AV	QPLGN0757GEZZ	Plug (7 pin)	AB	Q837	VS2SA1346/-1	Switching (Timer LED 9V)	AB
AX	QPLGN0413GEZZ	Plug (4 pin)	AB	Q838	VS2SA1347/-1	Switching (Record 2 key pulse)	AB
AY	QPLGN0557GEZZ	Plug (5 pin)	AB	Q839	VS2SC945APQ1E	Playback/Record switch mute	AB
PWB-E				Q840	VS2SC945APQ1E	Switching (Record 2 key pulse (Low))	AB
TRANSISTORS				Q841	VS2SA1347/-1	Playback/Record key pulse	AB
Q701	VS2SC945APQ1E	Servo clock amp.	AB	Q842	VS2SC945APQ1E	Record 2 key mute	AB
Q702	VS2SC3400/-1	Head switching pulse inverter	AB	Q843	VS2SC945APQ1E	Playback 2 key mute	AB
Q703	VS2SC945APQ1E	Drum pulse generator amp.	AB	Q844	VS2SC3400/-1	Timer switching mute	AB
Q704	VS2SC945APQ1E	Drum motor rush current limiter	AB	Q845	VS2SC945APQ1E	Buffer (Video mute buffer)	AB
Q705	VS2SA1347/-1	Inverter	AB	DIODES			
Q706	VS2SA733APQ1E	Reel drive amp.	AC	D702	VHD1SS119/-1	Diode (1SS119)	AB
Q707	VS2SC945APQ1E	Reel drive amp.	AB	713,			
Q708	VS2SB772-PQ-1	Unloading torque switching	AD	715			
Q709	VS2SC945APQ1E	Inverter (Slow/Still mute)	AB	724,			
Q710	VS2SC3400/-1	Inverter (Slow mute)	AB	726,			
Q711	VS2SC3401/-1	Inverter (Slow mute)	AD	729			
Q712	VS2SC945APQ1E	Buffer (Slow pulse buffer)	AB	733,			
Q713	VS2SC945APQ1E	Vertical Synchronization muting	AB	735,			
Q714	VS2SD882-PQ-1	Capstan motor drive	AD	738			
Q715	VS2SC945APQ1E	Capstan motor drive	AB	740,			
Q718	VS2SC1347/-1	Buffer (Slow pulse buffer)	AB	742,			
Q719	VS2SC1347/-1	Drum motor video search reverse switching	AB	751,			
Q720	VS2SC3401/-1	Drum motor video search forward switching	AD	752,			
Q725	VS2SC3400/-1	Muting, Edit	AB	753,			
Q801	VS2SC3401/-1	Muting, Sensor	AD	761,			
Q802	VS2SC3401/-1	Inverter (Reel pulse generator, Slow mode)	AD	762,			
Q803	VS2SC945APQ1E	Emitter follower	AB	802			
Q804	VS2SC945APQ1E	Bias control buffer	AB	814			
Q805	VS2SD1286LK-1	Supply reel brake	AE	815			
Q806	VS2SD1286LK-1	Take-up reel brake	AE	816			
Q809	VS2SC945APQ1E	Inverter (Master reel pulse)	AB	818,			
Q810	VS2SC945APQ1E	Inverter (Slow reel pulse)	AB	821			
Q811	VS2SA950-Y/1E	Playback 2, 9V	AD	824,			
Q812	VS2SA950-Y/1E	Record 2, 9V	AD	825			
Q816	VS2SA733APQ1E	Cassette down 9V	AC	826,			
Q818	VS2SC3401/-1	W-pause switch mute	AD	827,			
Q821	VS2SC945APQ1E	Inverter (Video search/Still mute)	AB	829			
Q822	VS2SC945APQ1E	Inverter	AB	839,			
Q823	VS2SA1347/-1	Slow 9V	AB	843			
Q825	VS2SC3400/-1	Playback/Record lock mute	AB	845,			
Q826	VS2SA733APQ1E	Switching	AC	850,			
Q827	VS2SC945APQ1E	Switching	AB	857			
Q828	VS2SC945APQ1E	Switching (Playback 2 key pulse (Low))	AB	860,			
Q829	VS2SA1347/-1	Switching (Playback 2 key pulse)	AB	865			
Q830	VS2SA1347/-1	Switching (Record 2 key pulse)	AB	867,			
Q831	VS2SA1347/-1	Switching (Pause/Still key pulse)	AB	872,			
				873			

REF.NO.	PART NO.	DESCRIPTION	CODE	REF. NO.	PART NO.	DESCRIPTION	CODE
INTEGRATED CIRCUITS				R790,	RVR - B4113GEZZ	100K ohm, Pot., D-1 False vertical sync. adj.	AD
IC701	RH- i X0107GEZZ	Drum/Capstan servo	AZ	794		100K ohm, Pot., D-2 False vertical sync. adj.	
IC702	VHi i R94558 / - 1	Capstan motor AFC/APC adder, Drum motor AFC/ APC adder	AF	R7709	RVR - B4259GEZZ	200K ohm, Pot., Slow speed adj.	AD
IC703	VHi TA7267P / - 1	Reel motor forward/ reverse switching	AL	R7713	RVR - M7135TAZZ	10K ohm, Pot., Slow speed pre-set adj.	AC
IC704	VHi UPA81C / - 1	Inverter (Reel mode switching)	AF	R7720,	RVR - M7143TAZZ	220K ohm, Pot., Drum motor video search shift forward adj.	AC
IC705	VHi BA6303 / - 1	Reel motor video search control	AK	7723		220K ohm, Pot., Drum motor video search shift reverse adj.	AC
IC706	VHi BAL6309 / - 1	False vertical synchronizing pulse generator	AP				
IC707	VHi i R94558 / - 1	Capstan motor frequency generator amp./Phase control signal amp.	AF AF				
IC708	VHi HA17555P - 1	Slow pulse generator	AH	COIL AND FILTER			
IC709	VHi TA7267P / - 1	Capstan motor forward/ reverse switching	AL	L701	VP - DF221K0000	220μH	AB
IC710	VHi TC4011BP - 1	Video search drum shift control	AF	FL801	RFi LC0003AEZZ	Filter (400KHz)	AE
IC801	RH- i X0096GEZZ	System controller	AY	RESISTORS			
IC802	VHi i R2403 / - 1	Buffer (inverter)	AK	R832,	VRS - VV3DB390J	39 ohm, 2W, 5%, Metal oxide film	AA
IC803	VHi TA7267P / - 1	Cassette motor forward/ reverse switching	AL	833			
IC804	VHi TA7267P / - 1	Loading motor forward/ reverse switching	AL	MISCELLANEOUS			
IC812	VHi HD14073P - 1	Mode selector (AND gate)	AE	SW801,	QSW - K0030CEZZ	Ejection switch	AB
CAPACITORS				802,		Rewind switch	
C724	VCEAEA1CW107M	100μF, 16V, Electrolytic	AC	803,		Play 2 switch	
C728	VCE9AA1HW105M	1μF, 50V, Electrolytic (nonpolar)	AB	804,		Fast forward switch	
C731	RC - EZ0025GEZZ	470μF, 16V, Electrolytic	AC	805,		Stop switch	
C741	VCEAEA1CW107M	100μF, 16V, Electrolytic	AC	806,		Record switch	
C744	VCE9AA1HW105M	1μF, 50V, Electrolytic (nonpolar)	AB	807	QSW - P0097GEZZ	Pause/Still switch	AF
C763	VCE9AA1CW476M	47μF, 16V, Electrolytic (nonpolar)	AC	SW808,		Slow switch	
C765	RC - EZ0025GEZZ	470μF, 16V, Electrolytic	AC	809		Playback/Record lock switch	
C768	VCSATA1CE335K	3.3μF, 16V, Tantulum	AC	SW810,	QSW - K0030CEZZ	Playback/Record switch	AB
C771	VCEAEA1CW107M	100μF, 16V, Electrolytic	AC	811		W-pause switch	
C822	RC - EZ0025GEZZ	470μF, 16V, Electrolytic	AC	SW812,	QSW - K0014CEZZ	Counter switch	AC
C823	VCEAEA1CW107M	100μF, 16V, Electrolytic	AC	813,		Clear switch	
C824	RC - EZ0025GEZZ	470μF, 16V, Electrolytic	AC	814,		Length switch	
CONTROLS				815,		Forward switch	
R714,	RVR - M7141TAZZ	100K ohm, Pot., Channel 2 phase adj.	AC	816,		Reverse switch	
716		100K ohm, Pot., Channel 1 phase adj.	AC	817,		Hour switch	
R753	RVR - M7133TAZZ	4.7K ohm, Pot., Reel motor torque shift adj.	AC	818,		Day switch	
R771	RVR - M7141TAZZ	100K ohm, Pot., Video search speed adj.	AC	819		Clock switch	
R783	RVR - B4084GEZZ	200K ohm, Pot., Tracking adj.	AD	EA	QPLGN0557GEZZ	Plug (5 pin)	AB
R784	RVR - B7054TAZZ	47K ohm, Pot., Tracking pre-set adj.	AD	EB	QPLGN0357GEZZ	Plug (3 pin)	AB
				EC	QPLGN0257GEZZ	Plug (2 pin)	AA
				ED	QPLGN0957GEZZ	Plug (9 pin)	AC
				EE	QPLGN0757GEZZ	Plug (7 pin)	AB
				EG	QPLGN0957GEZZ	Plug (9 pin)	AC
				EH	QPLGN0852GEZZ	Plug (8 pin)	AC
				EJ	QPLGN0652GEZZ	Plug (6 pin)	AB
				EK	QPLGN0957GEZZ	Plug (9 pin)	AC
				EL	QPLGN0257GEZZ	Plug (2 pin)	AA
				EM	QPLGN0252GEZZ	Plug (2 pin)	AA
				EN	QPLGN0852GEZZ	Plug (9 pin)	AC
				EO	QPLGN0452GEZZ	Plug (4 pin)	AB

REF.NO.	PART NO.	DESCRIPTION	CODE	REF. NO.	PART NO.	DESCRIPTION	CODE
EP	QPLGN0852GEZZ	Plug (8 pin)	AC	Q832	VS2SC3401 / - 1	Pause 1 key pulse (Low)	AD
EQ	QCNW - 1751GEZZ	(Harness)	AG	Q833	VS2SC3401 / - 1	Pause 2 key pulse (Low)	AD
ER	QCNW - 1749GEZZ	(Harness)	AG	DIODES			
ES	QCNW - 1750GEZZ	(Harness)	AG				
ET	QPLGN0752GEZZ	Plug (8 pin)	AB				
EU	QCNW - 1566GEZZ	(Harness)	AG				
EV	QCNW - 1565GEZZ	(Harness)	AK	D846	VHD1SS119 / - 1	Diode (1SS119)	AB
EX	QPLGN0713GEZZ	Plug (7 pin)	AB	849, 851 856			
PWB-G				INTEGRATED CIRCUITS			
TRANSISTORS				IC805	VHi HD14069P - 1	Logic element	AE
Q8001	VS2SC945APQ1E	Dew sensor amp.	AB	IC806	VHi TC4001BP - 1	Logic element	AF
Q8002	VS2SC945APQ1E	Dew sensor amp.	AB	IC807	VHi HD14073P - 1	Logic element	AE
Q8003	VS2SC945APQ1E	Inverter	AB	IC808	VHi TC4081BP - 1	Logic element	AF
Q8004	VS2SA1346 / - 1	Dew, 9V	AB	IC809	VHi BA225 / - 1	Monostable-multivibrator	AG
Q8028	VS2SC3401 / - 1	Power control 1 (Low)	AD	IC810	VHi HD14073P - 1	Logic element	AE
Q8029	VS2SC3401 / - 1	Power control 2 (Low)	AD	IC811	VHi BA225 / - 1	Monostable-multivibrator	AG
Q8030	VS2SC3401 / - 1	Power initial switching	AD	MISCELLANEOUS			
Q8032	VS2SA733APQ1E	Power initial amp.	AC	DA	QPLGN1052GEZZ	Plug (10 pin)	AC
Q8033	VS2SC945APQ1E	Power key mute	AB	DB	QPLGN0652GEZZ	Plug (6 pin)	AB
Q8051	VS2SC3401 / - 1	Inverter	AD	PWB-V			
DIODES				TRANSISTORS			
D8001, 8035 8038, 8040 8044, 8055, 8056, 8063, 8064	VHD1SS119 / - 1	Diode (1SS119)	AB	Q3302	VS2SC1815YW1E	Playback FM amp.	AB
INTEGRATED CIRCUITS				Q3303	VS2SC1815YW1E	Record amp.	AB
IC8002	VHi BA226A / - 1	Monostable-multivibrator	AG	Q3304	VS2SC1815YW1E	Record amp.	AB
IC8008	VHi HD14073P - 1	Logic element	AE	Q3305	VS2SC1815YW1E	Record/Playback head switching	AB
IC8009	VHi NJM2903D - 1	Compalator	AH	Q3306	VS2SC3401 / - 1	Switching	AD
MISCELLANEOUS				Q3307	VS2SC3401 / - 1	Inverter	AD
GA	QPLGN0457GEZZ	Plug (4 pin)	AB	DIODES			
GB	QPLGN1057GEZZ	Plug (10 pin)	AC	D3301	RH - EX0024CEZZ	Zener diode (RD6.2EB)	AB
PWB-D				D3302	VHD1SS119 / - 1	Diode (1SS119)	AB
TRANSISTORS				INTEGRATED CIRCUITS			
Q819	VS2SA733APQ1E	Playback/Record, 9V	AC	IC3301	VHi TA7339P / - 1	Pre-amp.	AN
Q820	VS2SC3401 / - 1	Playback/Record key pulse (Low)	AD	IC3302	VHi AN6307 / - 1	Record amp.	AK
CONTROLS				CONTROLS			
R3305,	RVR - B4105GEZZ	4.7K ohm, Pot., Channel-2 damping control	AD	3307		4.7K ohm, Pot., Channel-1 damping control	

REF. NO.	PART NO.	DESCRIPTION	CODE	REF. NO.	PART NO.	DESCRIPTION	CODE
R3326, 3327	RVR - B4102GEZZ	1.5Kohm, Pot., Record luminance level adj. 1.5K ohm, Pot., Record Chrominance level adj.	AD	R315, 317	RVR - B4105GEZZ	4.7K ohm, Pot., Channel-2 damping control 4.7K ohm, Pot., Channel-1 damping control	AD
TRIMMERS				TRIMMERS			
C3305, 3306	RT6 - H1034GEZZ	50pF, Channel 1 peak 50pF, Channel 2 peak	AD	C317, 320	RT6 - H1034GEZZ	50pF, Channel-2 peak 50pF, Channel-1 peak	AD
COILS				COILS			
L3301 L3303 L3304 L3305	VP - MK471K0000 VP - MK221K0000 VP - DF560K0000 VP - LK390K0000	470μH 220μH 56μH 39μH	AB AB AB AB	L301 L302 L303 L304	VP - MK221K0000 VP - DF560K0000 VP - LK390K0000 VP - MK471K0000	220μH 56μH 39μH 470μH	AB AB AB AB
MISCELLANEOUS				MISCELLANEOUS			
VA VB VC VD	QPLGN0724CEZZ QPLGN0224CEZZ QPLGN1058GEZZ QPLGN0258GEZZ	Plug (7 pin) Plug (2 pin) Plug (10 pin) Plug (2 pin)	AC AC AC AB	XA XB XC XD	QPLGN0724CEZZ QPLGN0224CEZZ QPLGN1058GEZZ QPLGN0258GEZZ	Plug (7 pin) Plug (2 pin) Plug (10 pin) Plug (2 pin)	AC AC AC AB
PWB-X				PWB-Y			
TRANSISTORS				TRANSISTORS			
Q301 Q302 Q303 Q304 Q306 Q307	VS2SC1815YW1E VS2SC1815YW1E VS2SC1815YW1E VS2SC3401/-1 VS2SC1815YW1E VS2SC3401/-1	Record amp. Record amp. Record/Playback head switching Switching Playback FM amp. Inverter	AB AB AB AD AB AD	Q202 Q203 Q204 Q206 Q207 Q208 Q209 Q210 Q211 Q212 Q213 Q214 Q5501 Q5502 Q5503 Q5504 Q5505 Q5506 Q5507 Q5508 Q5511 Q6601 Q6602 Q6603 Q6604 Q6605 Q6606	VS2SC1815YW-1 VS2SC1815YW-1 VS2SA1015Y/1E VS2SC1815YW-1 VS2SC945AQ/-1 VS2SC1815YW-1 VS2SC1815YW-1 VS2SC3401/-1 VS2SC1815YW-1 VS2SC945AQ/-1 VS2SA1015Y/1E VS2SC3401/-1 VS2SC1815YW-1 VS2SC1815YW-1 VS2SC1815YW-1 VS2SC3401/-1 VS2SC1815YW-1 VS2SC3401/-1 VS2SC3401/-1 VS2SC3401/-1 VS2SD468-C/-1 VS2SC945APQ1E VS2SC3401/-1 VS2SD655-DE1E VS2SA1048Y/1E VS2SC3401/-1	Emitter follower Video amp. Record/Edit switching Emitter follower White/Dark clip amp. Emitter follower Emitter follower Noise clip switching Emitter follower Emitter follower Record/Edit switching Record/Playback switching Emitter follower Record/Edit switching Record/Edit switching Record/Edit switching Emitter follower Manual killer switching Inverter Inverter SECAM Det. mute switching Bias oscillator amp. Oscillator control switch Inverter Liple filter Rectification Automatic level control mute	AC AC AC AC AC AC AD AC AC AC AD AC AC AC AC AD AD AD AD AD AD AB AD AC AB AD
DIODES				DIODES			
D301 D302	VHD1SS119/-1 RH-EX0024CEZZ	Diode (1SS119) Zener diode (RD6.2EB)	AB AB				
INTEGRATED CIRCUITS				INTEGRATED CIRCUITS			
IC301 IC302	VHi AN6307/-1 VHi TA7339P/-1	Record amp. Pre-amp.	AK AN				
CONTROLS				CONTROLS			
R310, 311	RVR - B4102GEZZ	1.5K ohm, Pot., Record luminance level adj. 1.5K ohm, Pot., Record chrominance level adj.	AD				
				Q6607 Q6608	VS2SC3401/-1 VS2SA1347/-1	Inverter E-E Monitor switch	AD AB

REF. NO.	PART NO.	DESCRIPTION	CODE	REF. NO.	PART NO.	DESCRIPTION	CODE
DIODES				C6607	VCE9AA1CW106M	10μF, 16V, Electrolytic (nonpolar)	AB
D201 D202, 203 D205, 207, 208 D209 D210, 5502 5505, 5507, 5508, 5510 5512, 6601 6604	VHD1SS119/-1 VHD1SS16-2/1E VHD1SS119/-1 VHD1SV68///-1 VHD1SS119/-1	Diode (1SS119) Diode (1SS16) Diode (1SS119) Diode (1SV68) Diode (1SS119)	AB AC AB AF AB	C6616 C6632	VCEAEA1CW107M VCE9AA1CW106M	100μF, 16V, Electrolytic 10μF, 16V, Electrolytic (nonpolar)	AC AB
				CONTROLS			
				R208	RVR - M4028GEZZ	4.7K ohm, Pot., E-E level adj.	AE
				R215, 217	RVR - B4105GEZZ	4.7K ohm, Pot., Dark clip adj. 4.7K ohm, Pot., White clip adj.	AD
				R225	RVR - B4107GEZZ	10K ohm, Pot., FM frequency adj.	AD
				R236	RVR - B4104GEZZ	3.3K ohm, Pot., Deviation adj.	AF
				R261	RVR - B4104GEZZ	3.3K ohm, Pot., Editing deviation adj.	AF
				R5535	RVR - M4032GEZZ	22K ohm, Pot., Record automatic phase control	AD
				R5541	RVR - M4030GEZZ	10K ohm, Pot., Record automatic frequency control	AE
				R6601	RVR - B4114GEZZ	150K ohm, Pot., Record bias (2) adj.	AD
				R6608	RVR - B4104GEZZ	33K ohm, Pot., Playback audio level (2) adj.	AF
INTEGRATED CIRCUITS				RESISTOR			
IC201 IC202 IC203 IC5501 IC5502 IC6601 IC6602 IC6603 IC6604	VHi TA7348P/-1 VHi AN6310/-1 VHi TA7348P/-1 VHi HA11781NT1 VHi BA7007/-1 VHi AN3990/-1 VHi UPC1513H-1 VHi TA7348P/-1 VHi TA7348P/-1	Video input selection switching Record signal processor (MOD. W/D clip, AGC Pre-emphasis) Video output selection switching Record chroma processor Record SECAM killer detector Audio signal processor Audio head switching Audio input selection switching Audio output selection switching	AK AS AK AZ AM AK AH AK AK	R6604	RR - XZ0037TAZZ	Fuse resistor	AB
CAPACITORS				COILS AND TRANSFORMERS			
C204 C212 C213 C215 C231 C234 C237, 238 C239, 241, 255, 257 C258 C260, 262, 282 C5537 C5543, 5553	VCE9EA1CW476M VCEADA1AW227M VCE9EA1CW476M VCEAEA1CW107M VCE9AA1EW475M VCE9AA1CW476M RC - EZ0129TAZZ VCEAEA1CW107M RC - EZ0106TAZZ VCEAEA1CW107M RC - EZ0129TAZZ VCEAEA1CW107M	47μF, 16V, Electrolytic (nonpolar) 220μF, 10V, Electrolytic 47μF, 16V, Electrolytic (nonpolar) 100μF, 16V, Electrolytic 4.7μF, 35V, Electrolytic (nonpolar) 47μF, 16V, Electrolytic (nonpolar) 220μF, 16V, Electrolytic 100μF, 16V, Electrolytic 470μF, 16V, Electrolytic 100μF, 16V, Electrolytic 220μF, 16V, Electrolytic 100μF, 16V, Electrolytic	AC AB AC AC AC AC AC AC AC AC AC AC AC AC AC	L201, 202, 203 L204 L205 L206 L207, 210, 211, 5501, 5503 L5504 L5505 L6601 L6602 FL201 FL203 FL5501 FL5502 FL5503 FL5504 FL6601 FL6602 T6601	VP - DF221K0000 VP - DF151K0000 VP - DF680K0000 VP - DF151K0000 VP - DF221K0000 RCi LP0015GEZZ RCi LP0014GEZZ RCi LP0002GEZZ RCi LP0008GEZZ RMPTD0129GEZZ RMPTD0086GEZZ RMPTD0198GEZZ RMPTD0188GEZZ RFi LC0014GEZZ RMPTD0126GEZZ RCi Li0052GEZZ RCi LF0016GEZZ RTRNH0032GEZZ	220μH 150μH 68μH 150μH 220μH 8.2mH 6.8mH 1mH 2.2mH Filter Filter Filter Filter Filter Filter Filter Filter Filter Oscillator transformer	AB AB AB AB AB AD AD AC AD AM AG AF AG AE AK AE AG AE

REF. NO.	PART NO.	DESCRIPTION	CODE	REF. NO.	PART NO.	DESCRIPTION	CODE
MISCELLANEOUS				Q603	VS2SC3401 / - 1	Automatic level control mute switching	AD
X5501	RCRSB0002CEZZ	Crystal oscillator	AM	Q604	VS2SC3401 / - 1	Inverter	AD
YA	QPLGN0757GEZZ	Plug (7 pin)	AB	Q605	VS2SC945APQ1E	Oscillator control switching	AB
YB	QPLGN0557GEZZ	Plug (5 pin)	AB	Q606	VS2SD468 - C / - 1	Bias oscillator amp.	AD
YC	QPLGN0357GEZZ	Plug (3 pin)	AB	DIODES			
YE	QPLGN1257GEZZ	Plug (12 pin)	AC	D405, 406	VHD1SS119 / - 1	Diode (1SS119)	AB
YJ	QPLGN0257GEZZ	Plug (2 pin)	AA	D410, 411	VHD1SS16 - 2 / 1E	Diode (1SS16)	AC
YH	QPLGN0657GEZZ	Plug (6 pin)	AB	D501	VHD1SS119 / - 1	Diode (1SS119)	AB
YO	QPLGN0457GEZZ	Plug (4 pin)	AB	505, 507			
PWB-C				514, 518, 601			
TRANSISTORS				INTEGRATED CIRCUITS			
Q401	VS2SC1815YW - 1	Playback equalizer amp.	AC	IC401	VHi HA11702 / - 1	Limiter, Automatic gain control, Drop out circuit	AU
Q402	VS2SC1815YW - 1	Playback equalizer amp.	AC	IC402	VHi HA11703 / - 1	Playback luminance signal processor (De-mod, Synchronizing signal separator, Noise cancel, Y/C Mix)	AV
Q403	VS2SC1815YW - 1	Emitter follower	AC	IC403	VHi TA7347P / - 1	FM signal switching	AG
Q404	VS2SC1815YW - 1	Playback FM amp.	AC	IC501	VHi HA11781NT1	Playback colour signal processor	AZ
Q405	VS2SC1815YW - 1	Emitter follower	AC	IC502	VHi BA7007 / - 1	Secam killer detector	AM
Q406	VS2SC1815YW - 1	False vertical synchronous switching	AC	IC503	RH - i Z0086GEZZ	Comb filter	AT
Q407	VS2SC1815YW - 1	Emitter follower	AC	IC601	VHi AN3990 / - 1	Audio processor	AK
Q408	VS2SC1815YW - 1	Emitter follower	AC	IC602	VHi UPC1513H - 1	Audio head switching	AH
Q409	VS2SC1815YW - 1	Emitter follower	AC	CAPACITORS			
Q410	VS2SC1815YW - 1	Playback video amp.	AC	C434	VCEADA1CW227M	220μF, 16V, Electrolytic	AC
Q414	VS2SA1015Y / - 1	Playback video amp.	AC	C445, 447, 462, 463, 473, 549	VCEAEA1CW107M	100μF, 16V, Electrolytic	AC
Q415	VS2SC1815YW - 1	Playback video amp.	AC	C570, 601	VCEADA1CW227M	220μF, 16V, Electrolytic	AC
Q416	VS2SC1815YW - 1	Emitter follower	AC	C619	VCE9AA1CW106M	10μF, 16V, Electrolytic (nonpolar)	AB
Q417	VS2SC1815YW - 1	Playback video amp.	AC	C623	VCEAEA1CW107M	100μF, 16V, Electrolytic	AC
Q418	VS2SC1815YW - 1	Emitter follower	AC	CONTROLS			
Q419	VS2SC1815YW - 1	Edit switching	AC	R476	RVR - B4100GEZZ	680 ohm, Pot., Playback luminance level adj.	AD
Q420	VS2SC1815YW - 1	Picture control amp.	AC				
Q421	VS2SC1815YW - 1	Picture control amp.	AC				
Q422	VS2SC1815YW - 1	Picture control amp.	AC				
Q423	VS2SC1815YW - 1	Emitter follower	AC				
Q424	VS2SC1815YW - 1	Playback FM amp.	AC				
Q425	VS2SC1815YW - 1	Emitter follower	AC				
Q501	VS2SC3401 / - 1	ID Killer switching	AD				
Q502	VS2SC1815YW - 1	ID amp.	AC				
Q503	VS2SC1815YW - 1	Emitter follower	AC				
Q504	VS2SC3401 / - 1	Automatic phase control switching	AD				
Q505	VS2SC1815YW - 1	Automatic phase control switching	AC				
Q506	VS2SC1815YW - 1	Emitter follower	AC				
Q507	VS2SC3401 / - 1	Manual killer switching	AD				
Q509	VS2SC1815YW - 1	Playback chroma amp.	AC				
Q510	VS2SC3401 / - 1	SECAM killer mute switching	AD				
Q515	VS2SC3401 / - 1	Inverter	AD				
Q517	VS2SC3401 / - 1	Lotation mute switching	AD				
Q518	VS2SC3401 / - 1	Inverter	AD				
Q519	VS2SC1815YW - 1	Emitter follower	AC				
Q520	VS2SC3401 / - 1	Automatic frequency control switching	AD				
Q521	VS2SC1815YW - 1	Emitter follower	AC				
Q522	VS2SC1815YW - 1	Local oscillator	AC				
Q523	VS2SC1815YW - 1	Emitter follower	AC				
Q524	VS2SC3401 / - 1	Comb filter switching	AD				
Q525	VS2SC1815YW - 1	Emitter follower	AC				
Q601	VS2SD655 - DE1E	Liple filter	AC				
Q602	VS2SA1048 / - 1	Rectification	AC				

REF. NO.	PART NO.	DESCRIPTION	CODE	REF. NO.	PART NO.	DESCRIPTION	CODE
R534	RVR - M4032GEZZ	22K ohm, Pot., Playback automatic phase control	AD	FL403	RMPTD0196GEZZ	Filter	AK
R541	RVR - M4030GEZZ	10K ohm, Pot., Playback automatic frequency control	AE	FL404	RMPTD0200GEZZ	Filter	AH
R543	RVR - B4109GEZZ	22K ohm, Pot., Carrier ballance adj.	AD	FL501	RMPTD0131GEZZ	Filter	AK
R568	RVR - B4105GEZZ	4.7K ohm, Pot., SECAM adj.	AD	FL502	RMPTD0120GEZZ	Filter	AF
R577	RVR - B4102GEZZ	1.5K ohm, Pot., Playback chroma level adj.	AD	FL503	RMPTD0188GEZZ	Filter	AG
R614	RVR - B4104GEZZ	3.3K ohm, Pot., Playback audio level (1) adj.	AF	FL504	RFi LCO014GEZZ	Filter	AE
R635	RVR - B4114GEZZ	150K ohm, Pot., Record bias (1) adj.	AD	FL601	RCi LFO016GEZZ	Filter	AG
TRIMMER				DL602	RCi Li 0052GEZZ	Intermediate frequency coil	AE
C578	RT6 - H1040GEZZ	20pF, 4.44MHz adj.	AC	DL401	RCi LZ0082GEZZ	Delay line	AS
RESISTOR				DL501	RCi LZ0149GEZZ	Delay line	AT
R634	RR - XZ0037TAZZ	Fuse resistor, 4.7 ohm, 1/4W	AB	T601	RTRNH0032GEZZ	Oscillator transformer	AE
COILS AND TRANSFORMERS				MISCELLANEOUS			
L401	VP - LK390K0000	39μH	AB	X501	RCRSB0002CEZZ	Crystal	AM
L402	VP - DF330K0000	33μH	AB	X503	RCRSB0008GEZZ	Crystal, 4.44MHz oscillator	AL
L403	VP - LK151K0000	150μH	AB	CA	QPLGN0857GEZZ	Plug (8 pin)	AC
L404	VP - LK150K0000	15μH	AB	CB	QPLGN0557GEZZ	Plug (5 pin)	AB
L405	VP - DF221K0000	220μH	AB	CD	QPLGN0357GEZZ	Plug (3 pin)	AB
L406, 407	VP - DF8R2K0000	8.2μH	AB	CH	QPLGN0852GEZZ	Plug (8 pin)	AC
L408	VP - DF221K0000	220μH	AB	CI	QPLGN0257GEZZ	Plug (2 pin)	AA
L409	VP - LK470K0000	47μH	AB	CK	QPLGN0257GEZZ	Plug (2 pin)	AA
L411, 412	VP - LK221K0000	220μH	AB	CL	QPLGN0257GEZZ	Plug (2 pin)	AA
L413	VP - LK221K0000	220μH	AC	PWB-H			
L416	VP - MK221K0000	220μH	AB	TRANSISTORS			
L419	VP - LK820K0000	82μH	AB	Q8501	VS2SA1347 / - 1	Pause/Still switching	AB
L420	VP - LK680K0000	68μH	AB	Q8502	VS2SA1347 / - 1	Record switching	AB
L422	VP - LK221K0000	220μH	AC	Q8503	VS2SA1347 / - 1	Playback switching	AB
L425	VP - LK470K0000	47μH	AB	Q8504	VS2SA1347 / - 1	Fast forward switching	AB
L501	VP - DF270K0000	27μH	AB	Q8505	VS2SA1347 / - 1	Rewind switching	AB
L503	VP - DF221K0000	220μH	AB	Q8506	VS2SA1347 / - 1	Stop switching	AB
L504	VP - DF390K0000	39μH	AB	Q8507	VS2SA1345 / - 1	Switching (Operate)	AC
L505, 506, 507	VP - MK221K0000	220μH	AB	Q8508	VS2SA1345 / - 1	Switching (Remote control inverter)	AC
L508	RCi LP0015GEZZ	8.2mH	AD	DIODES			
L510	VP - MK120K0000	12μH	AB	D1401	RH - PX0032GEZZ	Light emitting diode	AC
L511	VP - LK150K0000	15μH	AB	1408			
L512	VP - DF221K0000	220μH	AB	D8501,	RH - PX0069GEZZ	Light emitting diode (cassette down)	AQ
L514	RCi LP0014GEZZ	6.8mH	AD	8502			
L515	VP - DF221K0000	220μH	AB	D8504	RH - PX0032GEZZ	Light emitting diode (Rewind)	AC
L516	VP - MK221K0000	220μH	AB	D8505	RH - PX0043GEZZ	Light emitting diode (Play)	AD
L517	VP - DF221K0000	220μH	AB	D8506,	RH - PX0032GEZZ	Light emitting diode (Fast forward)	AC
L601	RCi LP0008GEZZ	2.2mH	AD	8507,		Light emitting diode (Pause/Still)	
L602	RCi LP0002GEZZ	1mH	AC	8508,		Light emitting diode, (Record)	
FL401	RMPTD0194GEZZ	Filter	AG	8509,		Light emitting diode, (Power)	
FL402	RMPTD0195GEZZ	Filter	AG	8510		Light emitting diode, (Timer)	

REF. NO.	PART NO.	DESCRIPTION	CODE	REF. NO.	PART NO.	DESCRIPTION	CODE
D8511 D8512 D8851	RH- EX0042TAZZ RH- DX0142CEZZ RH- PX0082PAZZ	Zener diode (RD4.7EB2) Diode (1SS133) Photo diode	AB AB AH	MISCELLANEOUS			
INTEGRATED CIRCUITS				SW1401	QSW- S0036GEZZ	Automatic fine tuning switch	AE
IC8501 IC8851	VHi LR3711M/ - 1 RH- i X0310PAZZ	Remote control decoder Remote control pulse amp.	AN AH	UA	QPLGN1073GEZZ	Plug (10 pin)	AC
CAPACITORS				PWB-I			
C8852, 8855	VCEAEA1CW107M	100 μ F, 16V, Electrolytic	AC	TRANSISTORS			
COIL AND FILTER				Q1501	VS2SC1906/ / 1E	Intermediate frequency amp.	AC
L8851 X8501	RCi Li 3580PAZZ RFi LA0001CEZZ	Intermediate frequency coil Filter	AE AF	Q1502	VS2SC945APQ1E	Picture intermediate frequency/Sound intermediate frequency Separator amp.	AB
MISCELLANEOUS				Q1503	VS2SC1815YW- 1	Emitter follower	AC
SW1401 SW8501 SW8502 HA HB HC	RRMCU0024GEZZ QSW- P0068GEZZ QSW- P0077GEZZ QSW- P0058GEZZ QPLGN1052GEZZ QPLGN0857GEZZ QPLGN0752GEZZ	Remote control reciever Channel switch Power switch Timer switch Plug (10 pin) Plug (8 pin) Plug (7 pin)	AW AQ AF AF AC AA AB	Q1504	VS2SC1815YW- 1	Video amp.	AC
PWB-U				Q1505	VS2SC1815YW- 1	Video amp.	AC
TRANSISTORS				Q1507	VS2SK30AG/ / 2E	Automatic fine tuning mpte	AD
Q1401 Q1402 Q1403 Q1404	VS2SA1348/ / - 1 VS2SA1348/ / - 1 VS2SA1348/ / - 1 VS2SC945APQ1E	Band switching (UHF) Band switching (VH) Band switching (VL) Video tape drive	AB AB AB AB	DIODES			
DIODES				D1501, 1502, 1503	RH- DX0142CEZZ	Diode (1SS133)	AB
D1411 1427	VHD1SS119/ / - 1	Diode (1SS119)	AB	INTEGRATED CIRCUITS			
INTEGRATED CIRCUIT				IC1501	RH- i X0113GEZZ	Picture intermediate frequency detector	AR
IC1401	RH- i X0037CEZZ	Zener IC (UPC574J)	AF	IC1502	RH- i X0055GEZZ	Sound intermediate frequency detector	AG
CONTROL				CAPACITORS			
R1422	RVR- Y4102GESA	50K ohm x 8, Pot., Tuning variable resistor	AQ	C1511	VCE9AA1HW105M	1 μ F, 50V, Electrolytic (nonpolar)	AB
				C1521, 1533	VCEAEA1CW107M	100 μ F, 16V, Electrolytic	AC
				CONTROL			
				R1511	RVR- B4004CEZZ	10K ohm, Pot., Radio frequency automatic gain control adj.	AC
				COILS AND TRANSFORMERS			
				L1501, 1502	VP- DFR47M0000	0.47 μ H	AB
				L1503, 1504	VP- DF2R2M0000	2.2 μ H	AB
				L1505	VP- DF100K0000	10 μ H	AB
				L1506	VP- DF560K0000	56 μ H	AB
				L1507, 1508	VP- DF4R4K0000	4.7 μ H	AB
				L1509	VP- DF220K0000	22 μ H	AB

REF. NO.	PART NO.	DESCRIPTION	CODE	REF. NO.	PART NO.	DESCRIPTION	CODE
L1510 CF1501 CF1502 SF1501 T1501	VP- DF150K0000 RFi LC0020CEZZ RFi LC0007CEZZ RFi LC0056CEZZ RCi LD0096CEZZ	15 μ H 5.5MHz Trap 5.5MHz Filter Surface acoustic wave filter Picture intermediate detection trans.	AB AE AE AL AE	CAPACITOR			
T1502 T1503	RCi LD0097CEZZ RCi LD0012GEZZ	Automatic fine tuning trans. Detection trans.	AE AE	C5008	VCEAEA1CW107M	100 μ F, 16V, Electrolytic	AC
MISCELLANEOUS				RESISTORS			
IA IB	VTUACDE1- 009/ QPLGN0952GEZZ QPLGN0557GEZZ	Tuner Plug (9 pin) Plug (5 pin)	BK AC AB	R5001 R5002, 5009 R5015	RMP1C0063GEZZ RMP1C0062GEZZ RR- XZ0037TAZZ	100k ohm x 10, Packaged circuit 82K ohm x 4, Packaged circuit Fuse resistor, 4.7 ohm, 1/4W	AC AB AB
PWB-T				COIL AND TRANSFORMER			
Q5001 Q5002	VS2SA937- Q/ - 1 VS2SA937- Q/ - 1	Auto clear switching Wave shaping	AC AC	L5001 T5001 X5001	RCi LP0002GEZZ RUNTK0259GEZZ RFi LA0008GEZZ	1mH DC-DC converter Filter (500K)	AC AV AE
TRANSISTORS				MISCELLANEOUS			
D5001 5004, 5007, 5008 D5009 D5010	RH- DX0142CEZZ RH- EX0010GEZZ RH- PX0032GEZZ	Diode (1SS133) Zener diode (RD5.6EB) Light emitting diode, Playback \rightarrow Record (Red light)	AB AB AC	DG5001 SW5002, 5003	VVK13B11ZK- 1 QSW- K0030GEZZ	Indicator Resetting switch Memory switch	AY AB
D5012, 5013, 5014	RH- PX0032GEZZ	Light emitting diode, Pause/Still (Red light) Light emitting diode, Record (Red light) Light emitting diode, Fast forward (Red light)	AC	TA TB TC TD TE	QPLGN0452GEZZ QPLGN0952GEZZ QPLGN0457GEZZ QPLGN0652GEZZ QPLGN0952GEZZ	Plug (4 pin) Plug (9 pin) Plug (4 pin) Plug (6 pin) Plug (9 pin)	AB AC AB AB AC
D5015 D5016 D5018 D5019, 5020 D5021, 5022	RH- PX0043GEZZ RH- PX0032GEZZ RH- PX0043GEZZ RH- PX0069GEZZ RH- DX0142CEZZ	Light emitting diode, Play (Green light) Light emitting diode, Rewind (Red light) Light emitting diode, Relay playback (Green light) Light emitting diode, Cassette Input (Green light) Diode (1SS133)	AD AC AD AQ AB	PWB-P			
INTEGRATED CIRCUITS				TRANSISTORS			
IC5001 IC5002	VHi M66503SL- 1 VHi i R2C05/ / - 1	Timer control Driver	AT AH	Q901 Q902 Q903 Q904, 905 Q906 Q907 Q908 Q909 Q910 Q911 Q912	VS2SC945AQ/ - 1 VS2SC1815YW1E VS2SB553YLB1E VS2SC945AQ/ - 1 VS2SC1815YW1E VS2SA733AQ/ - 1 VS2SA1015Y/ 2E VSDTA124N/ / - 1 VS2SC945AQ/ - 1 VS2SC1815YW1E VS2SD1128/ / - 1 VS2SC945AQ/ - 1 VS2SC1815YW1E VS2SC1983- / - 1 VS2SA958Y/ / 2E VS2SC945AQ/ - 1	Power fail switching PC 12V Regulator Excitation amp. Error amp. Switching Power control PC 9V Regulator Error amp. AT 9V Regulator AT 33V Regulator Error amp.	AB AE AB AC AB AC AB AB AB AG AB AG AK AB

REF.NO.	PART NO.	DESCRIPTION	CODE	REF. NO.	PART NO.	DESCRIPTION	CODE
△Q913	VS2SC945AQ/-1	Protector	AB	△R933	RR-XZ0003GEZZ	Fuse resistor, 4.7V, 1/2W	AB
△Q914	VS2SA733AQ/-1	Protector	AB	△R939	VRD-RA2BE392J	3.9K ohm, 1/8W, 5%, Carbon	AA
Q915	VS2SC3401/-1	Power save switching	AD	△R941	VRW-KT3DCR22K	0.22 ohm, 2W, 10%, Cement	AC
DIODES				MISCELLANEOUS			
D901, 905, 906	RH-DX0085TAZZ	Diode	AC	△TH901	VHH5KD-5//1A	Thermistor	AB
D907	RH-EX0010GEZZ	Zener diode (RD5.6EB)	AB	△F901	QFS-C4021GEZZ	Fuse, T4.0A	AE
D908, 909	RH-EX0048CEZZ	Zener diode (RD6.2EB)	AB	PA	QPLGN0747GEZZ	Plug (7 pin)	AB
D910	RH-DX0142CEZZ	Diode	AB	PB	QPLGN0347GEZZ	Plug (3 pin)	AB
	or			PC, PD, PE	QPLGN0447GEZZ	Plug (4 pin)	AB
D911	VHD1SS119//1	Diode (1SS119)	AB		QPLGN0568GEZZ	Plug (5 pin)	AC
D912, 913	RH-EX0020GEZZ	Zener diode (RD5.1EB3)	AE	PWB-O			
D914	RH-DX0142CEZZ	Diode	AB	CAPACITOR			
	or			△C9001	RC-QZ0099GEZZ	0.1μF, AC300V, Metalized polyester film	AG
D915	VHD1SS119//1	Diode (1SS119)	AB	MISCELLANEOUS			
D916	RH-EX0055GEZZ	Zener diode (MTZ6.2A)	AB	△SW9001	QSW-S0078GEZZ	AC select switch	AF
CAPACITORS				△F9001	QFS-C1621GEZZ	Fuse (T1.6A)	AE
C901	RC-EZ0131TAZZ	10μF, 250V, Electrolytic	AD	△OA	QPLGN0370GEZZ	Plug (2 pin)	AB
C902, 903	VCEAEA1HW225M	2.2μF, 50V, Electrolytic	AB	△	QACCV2017GEZZ	AC cord	AN
C904	VCKYD11CY103N	10pF, 16V, Ceramic	AA	PWB-Q			
C905	RC-EZ0028GEZZ	220μF, 16V, Electrolytic	AC	TRANSFORMER			
C906	VCKYD11CY103N	10pF, 16V, Ceramic	AA	△T901	RTRNP0129GEZZ	Power transformer	BF
C907	VCEAEA1CW106M	10μF, 16V, Electrolytic	AB	RESISTOR			
C908	RC-EZ0021GEZZ	470μF, 16V, Electrolytic	AC	△R9001	RR-DZ0001GEZZ	12M ohm, 1/2W	AD
C909	VCEAEA1CW106M	10μF, 16V, Electrolytic	AB	MISCELLANEOUS			
C910	RC-EZ0021GEZZ	470μF, 16V, Electrolytic	AC	QA	QPLGN0569GEZZ	Plug (5 pin)	AC
C911	VCEAAA1CW226M	22μF, 16V, Electrolytic	AB	THE OTHER PARTS			
C912	VCKYD11CY103N	10μF, 16V, Ceramic	AA		RTUNE0193GEZZ	Booster convertor	BL
△C913	VCEAEA1CW107M	100μF, 16V, Electrolytic	AC		QTANN9119GEZZ	Antenna terminal	AX
CONTROLS					TINS-0418GEZZ	Instruction manual	AN
R913, 922, 937	RVR-B4101GEZZ	1K ohm, Pot., 12V adj. 1K ohm, Pot., PC 9V adj. 1K ohm, Pot., AT 9V adj.	AC		RRMCG0073GESA	Remote control receiver	BB
RESISTORS							
△R901	RR-XZ0037TAZZ	Fuse resistor, 4.7 ohm, 1/4W	AB				

MECHANICAL PARTS

REF.NO.	PART NO.	DESCRIPTION	CODE	REF. NO.	PART NO.	DESCRIPTION	CODE
1	Hi NDP0202GESA	AFT switch indication plate	AG	31	DUNTK1528HE00	Sub mechanical PWB (2)	-
2	HPNLC1230GESA	Pre-setting panel	AG	32	XEBS330P12000	Screw	AA
3	PSPAHO014GEZZ	AFT switch spacer	AA	33	DUNTK1529HE00	Sub mechanical PWB (1)	-
4	LHLDZ1293GEZZ	LED holder	AB	34	RUNTK0260GEZZ	Power chopper stabilizer	BP
5	LHLDZ1353GEZZ	Channel LED holder	AC	35	LANGF9217GEZZ	Power angle	AK
6	LHLDZ1357GEZZ	Cassette insertion indicator holder	AC	36	DUNTK1460HE00	Y/C audio PWB(1) ass'y	-
				37	DUNTK1461HE00	Y/C audio PWB(2) ass'y	-
7	LHLDZ1354GEZZ	Operation LED holder	AD	38	PZETV0212GEZZ	Chloridizing vinyl insulator	AF
8	LHLDZ1356GEZZ	Digitron holder	AF	39	95KPAE0150ZZ	Chopper PWB	AL
9	GCABB1020GESA	Cabinet (B)	AZ	40	HING-1006GEZZ	Hinge	AB
10	Hi NDP0553GESA	Indicator (Power on)	AC	41	LHLDZ1014GEZZ	Holder	AC
11	QEARP0108GEFW	Earth plate (in bottom plate)	AD	42	95KECE0484ZZ	Cassette housing processing goods	AH
12	TLABS0061GEZZ	Power caution label	AB	43	PZETV0191GEZZ	Power primary insulating plate	AG
13	TCAUH3023GEZZ	Radio frequency converter label	AA	44	95KEDE0334ZZ	Processing wire with terminal	AC
14	PSPAV0057GEZZ	Sliding switch spacer	AA	45	95KRBZ3012ZZ	Expansion nut	AA
15	PSPAZ0073GEZZ	Operation button spacer	AD		or		
16	PSPAZ0074GEZZ	Dubbing button spacer	AC		95KUAS0018ZZ	Insulating bush	AD
17	TLABM0610GEZZ	Model label	AB	46	95KLZ0310ZZ	Case	AM
18	UKGD0001GEZZ	Adjusting screw driver	AB	47	95KLZ0311ZZ	Case	AL
19	XEBSD40P16000	Cup tight screw 4x16	AA	48	95KLZ0326ZZ	Cover	AL
20	DUNTK1454HE00	Tuning volume PWB	-	49	95KLZ0325ZZ	Heat-sink	AR
21	DUNTK1453HE00	Intermediate frequency tuning PWB ass'y	-	50	95KRAZ3010ZZ	Screw	AA
22	XEBS330P12000	Cup tight screw 3x12	AA	51	95KGZZ0205ZZ	Insulating plate	AG
23	DUNTK1465HE00	Channel selection PWB ass'y	-	52	LANGF9217GEZZ	Angle	AK
				53	DUNTK1458HE00	Power primary PWB	-
24	QSW-P0068GEZZ	Switch (Channel selection)	AO	54	XHPSD30P06WS0	Screw	AA
25	XEBS330P08000	Screw	AA	55	XJBSD40P06000	Screw	AA
26	DUNTK1464HE00	Timer circuit PWB	-	56	DUNTK1462HE00	System Control/ Servo (1) PWB	-
27	DUNTK1457HE00	Power secondly circuit PWB	-	57	DUNTK1463HE00	System Control/ Servo (2) PWB	-
28				58	95KRAZ4029ZZ	Screw	AA
29	PRDAF1047GEFW	Radiator plate	AH				
30	QTANN9119GEZZ	Antenna terminal	BL				

1 2 3 4 5 6 7 8 9 10 11 12

MECHANISM CHASSIS PARTS DIAGRAM

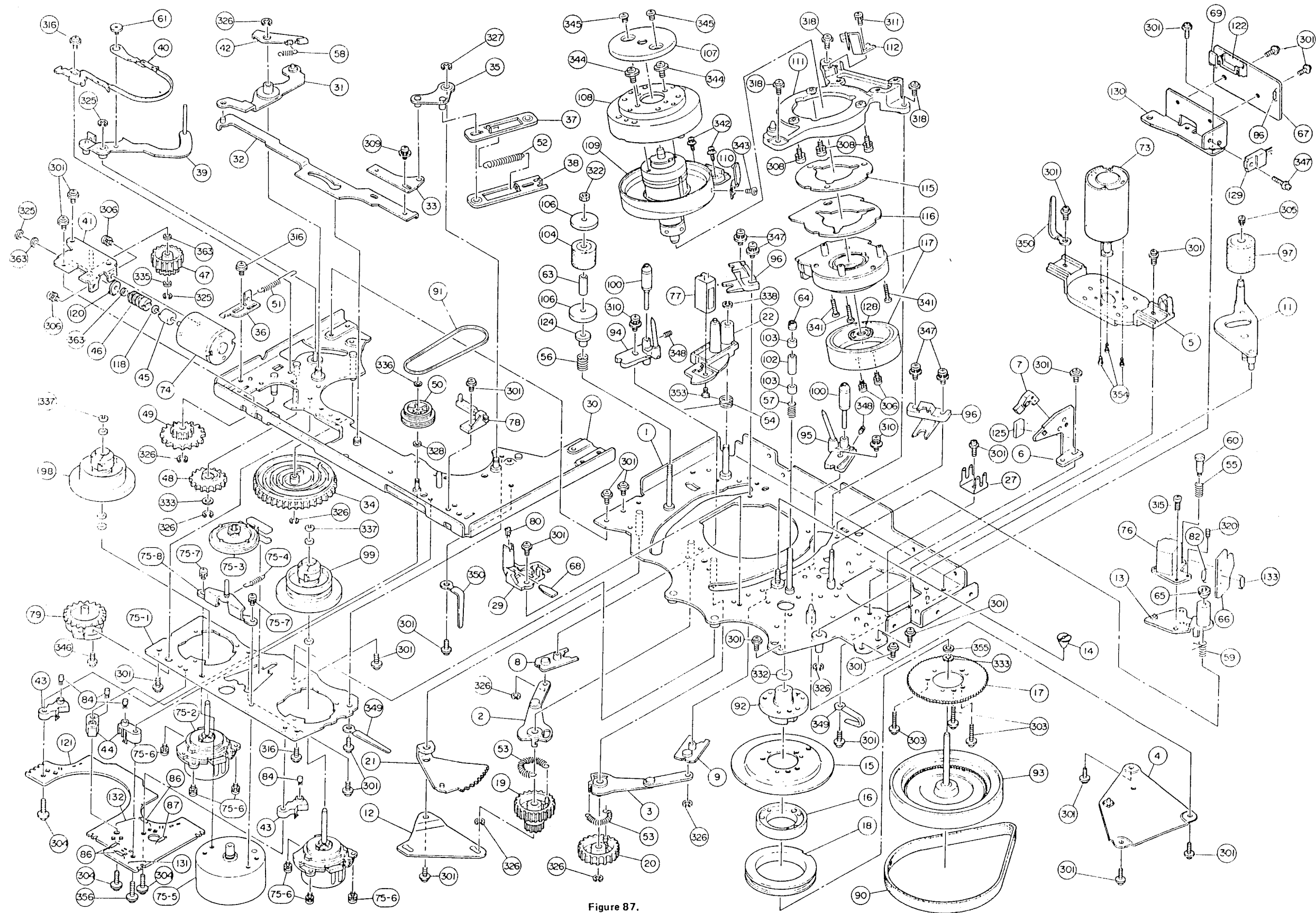


Figure 87.

MECHANICAL PARTS DIAGRAM

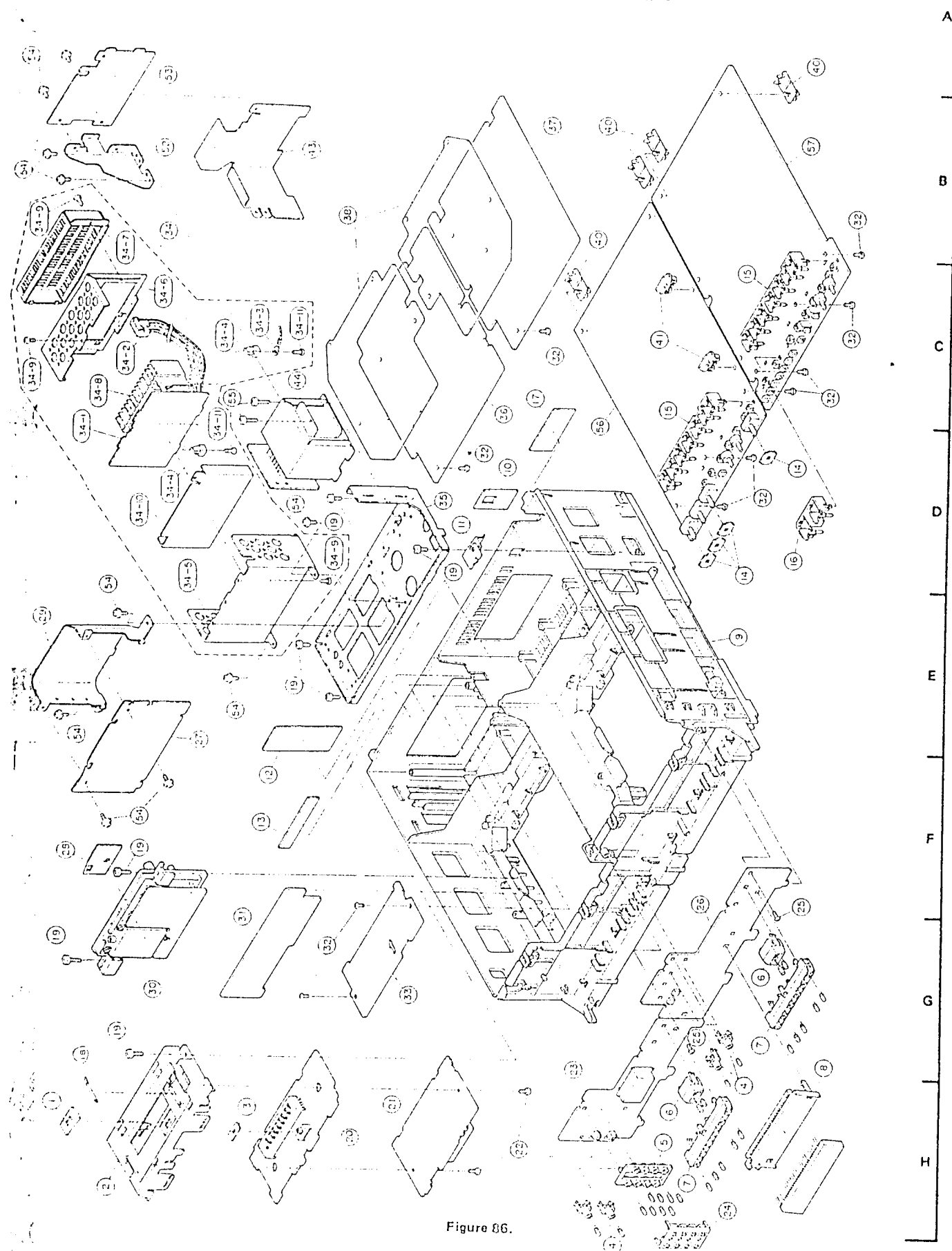


Figure 86.

MECHANISM CHASSIS PARTS

REF.NO.	PART NO.	DESCRIPTION	CODE	REF. NO.	PART NO.	DESCRIPTION	CODE
1	LCHSM0060GEZZ	A chassis ass'y	—	65	LX- NZ3014GEFW	Adjusting nut 388A	AA
2	MARMM0033GEZZ	Loading arm A ass'y	AF	66	QPWBF1168GEZZ	A/C head base (Deck-1)	—
3	MARMM0034GEZZ	Loading arm B ass'y	AF	67	QPWBF1570GEZZ	A/C head base (Deck-2)	—
4	LANGF9165GEZZ	Flywheel angle ass'y	AE	68	QPWBF0811GEZZ	Mechanical platform base	—
5	LANGT9075GE09	Capstan motor holder	AE	69	QPLGN0212GEZZ	LED platform base	—
6	LANGF9243GEFW	Cassette cover opening angle	AC	73	RM6TP1066GEZZ	Connector (2P)	AC
7	PGiDM0040GEZZ	Cassette cover opening guide	AC	74	RM6TM1027GEZZ	Capstan motor	BB
8	PGiDH0022GEZZ	Slider A ass'y	AE	75		Loading motor	AT
9	PGiDH0023GEZZ	Slider B ass'y	AE	75-1	LCHSS0008GEFW	Reel unit chassis	—
11	MLEVF0213GEZZ	Pinch roller lever ass'y	AL	75-2	RPLU-0068GEZZ	Reel brake ass'y	AQ
12	LANGF9236GEFW	Loading gear plate	AB	75-3	NiDL-0006GEZZ	Reel idler ass'y	AL
13	MLEVF0185GEZZ	A/C head arm ass'y	AD	75-4	MSPRT0181GEFJ	Reel idler engagement spring	AA
14	LX- NZ3013GEFW	Adjusting nut	AA	75-5	RM6TV1007GEZZ	Reel motor	BA
15	LANGQ9028GEFD	F.G. yoke	AE	75-6	XHPSD26P04000	S-tight screw	AA
16	PSPAF0011GEFD	F.G. spacer	AH	75-7	XBPSD30P07J00	Sems A screw	AA
17	NGERH3008GEFD	Stator gear (P)	AG	75-8	LANGF9165GEFW	Cassette unlock angle ass'y	—
18	RSTR-0030GEZZ	F.G. bobbin ass'y	AH	76	RHEDU0040GEZZ	AC head ass'y	AZ
19	NGERH3010GEZZ	Loading gear A ass'y	AH	77	RHEDT0012GEZZ	Full erase head ass'y	AR
20	NGERH1022GEZZ	Loading gear B ass'y	AD	78	QSW- F0009GEZZ	Cassette down SW	AD
21	NGERH3005GEZZ	Segment gear ass'y	AE	79	QSW- R0008GEZZ	Mechanical position SW	AM
22	MARMP0019GEZZ	FE head arm	AD	80	RH- PX0046GEZZ	LED-S	AG
27	QEARP0015GEFW	Earth terminal plate	AB	82	VRD- RA2EE100J	Resistor (Audio head)	AA
29	LHLDP1006GE00	LED holder S	—	84	RH- PX0042GEZZ	Photo-coupler, Deck-1(Q8891), Deck-2(Q8881, Q8882, Q8883)	AH
30	LCHSM0059GEZZ	B-chassis ass'y	—	86	VRD- RA2EE681J	Resistor (680 ohm), Deck-1(R8892), Deck-2(R8882, R8883, R8884)	AA
31	MARMM0040GEZZ	Shifter arm ass'y	AH	87	VRD- RA2EE272J	Resistor (2.7k ohm), Deck-1(R8891), Deck-2(R8881)	AA
32	MSLi F0014GEZZ	Shifter ass'y	AF	90	NBLTH0022GE00	Capstan belt, 8347	AE
33	MLEVF0184GEFW	Shifter adjusting plate	AB	91	NBLTK0030GE00	Counter belt A	AB
34	NGERH1043GEZZ	Master cam	AD	92	NBRGC0024GEZZ	Capstan holder ass'y PAL	AH
35	MLEVF0214GEZZ	Pinch roller drive lever ass'y	AH	93	NFLYV0038GEZZ	Capstan flywheel ass'y PAL	AR
36	LANGF9167GEFW	Tension arm spring angle	AB	94	LP6LM0018GEZZ	Pole base A ass'y	AM
37	MLEVF0131GEFW	Pinch roller double action lever (upper)	AC	95	LP6LM0019GEZZ	Pole base B ass'y	AM
38	MLEVF0132GEFW	Pinch roller double action lever (lower)	AC	96	PGiDC0010GEFW	V-block	AG
39	MLEVF0215GEZZ	Tension arm ass'y	AK	97	NR6LR0009GEZZ	Pinch roller ass'y	AP
40	LBNDK3014GEZZ	Tension band ass'y	AH	98	NDAi V1029GEZZ	Supply reel disk ass'y 8542	AK
41	LANGT9079GEZZ	Loading motor angle ass'y	AK	99	NDAi V1028GEZZ	Take-up reel disk ass'y 8347	AK
42	MLEVF0180GEZZ	Auxiliary brake ass'y	AC	100	NR6LP0024GEZZ	Guide roller ass'y	AL
43	LHLDZ1193GEZZ	Reel sensor holder	AB	102	PGiDP0001GEFW	Fixed guide	AE
44	LHLDZ1194GEZZ	Counter sensor holder	AB	103	PGiDP0003GEFW	Guide flange B	AC
45	NPLYV0097GEZZ	Loading motor pulley	AB	104	NR6LP0046GEZZ	SI roller P	AH
46	NGERW1007GEZZ	Loading worm ass'y	AB	106	PGiDS0005GEZZ	SI roller flange B	AE
47	NGERH1041GEZZ	Worm wheel	AB	107	PSLDM3440GEZZ	VH amp. lead shield case	AC
48	NGERH1044GEZZ	Tension arm escape cam	AB	108	DDRMU0002HE18	Upper drum ass'y (Deck-1)	BN
49	NGERH1042GEZZ	Loading neutral gear	AB	108	DDRMU0002HE19	Upper drum ass'y (Deck-2)	BN
50	NPLYV0094GE00	Counter platform pulley (Deck-1)	AB	109	DDRML0004HE11	Lower drum ass'y	BL
50	NPLYV0088GEZZ	Counter platform pulley (Deck-2)	AB	110	RHETP0004GEZZ	PTC heater	AH
51	MSPRT0178GEFJ	Tension arm spring	AA	111	RGiDC0015GEZZ	V base ass'y	AG
52	MSPRT0139GEFJ	Pinch roller pressure spring	AA	112	QBRSK0011GEZZ	Earth brush ass'y	AE
53	MSPRT0140GEFJ	Double action spring	AA	115	PSLDM3437GEZZ	Drum motor shield plate	AD
54	MSPRD0030GEFJ	Full erase head arm spring	AA	116	PZETV0124GEZZ	DD shield-insulator	AA
55	MSPRC0066GEFJ	Audio control head spring	AA	117	RM6TP1050GEZZ	DD motor ass'y	BF
56	MSPRC0015GEFJ	Adjusting spring A	AA	118	PSPAG0013GE00	Gum spacer	AB
57	MSPRC0016GEFJ	Adjusting spring B	AB				
58	MSPRT0179GEFJ	Auxiliary brake spring	AA				
59	MSPRD0046GEFJ	A/C head arm Spring	AA				
60	LX- BZ3018GEZZ	A/C head screw	AA				
61	LX- BZ3026GEFD	Tension spacer screw	AB				
63	NSFTL0215GEFW	Supply impedance roller, inner	AB				
64	LX- NZ3016GEFD	Adjusting nut 200S	AB				

REF.NO.	PART NO.	DESCRIPTION	CODE	REF. NO.	PART NO.	DESCRIPTION	CODE
120	NBRGP0004GEZZ	Worm bearing	AB	125	RDTCH0014GEZZ	Dew sensor (Deck-1)	AG
121	QPWBF1418GEZZ	Mechanism platform (Deck-1)	—	128	PSPA20031GEZZ	D.D. motor spacer	AC
121	QPWBF1417GEZZ	Mechanism platform (Deck-2)	—	129	VS2SD1273// - 1	Transistor (Q8871)	AF
122	OPLGN0958GEZZ	Connector (9 Pin)	AC	130	LANGQ5037GEFW	Angle	AG
124	PGIDS0010GEZZ	Guide flange-base	AG	131	QJUM-1001CEFW	Jumper-10mm	—
				132	QJUM-2001CEFW	Jumper-15mm	—
				133	VP-DF150K0000	15 μ H	AB

CABINET PARTS

REF.NO.	PART NO.	DESCRIPTION	CODE	REF. NO.	PART NO.	DESCRIPTION	CODE
1	LANGG9035GEFW	Power-button guide plate	AB	22	HiNDP0626GESA	Feature label indicating plate	AC
2	JBTN-1507GESA	Button (Power)	AD	23	GD6RF3007GESA	Door (Tracking)	AP
3	JBTN-1508GESA	Button (Timer)	AD	24	HBDGB1057AFSA	Badge, "SHARP"	AD
4	CHNG-1018GEZZ	Channel button hinge ass'y	AU	25	HiNDP0595GESA	Operation part decoration plate	AT
5	CHNG-1016GEZZ	Pause button hinge ass'y (Double pause/Still, PLAY/REC)	AU	26	HDECA0091GESA	Operation part indication plate	AH
6	CHNG-1015GEZZ	Operation button hinge ass'y	AU	27	TCAUZ3004GEZZ	Caution label (Copy right)	AA
7	JBTN-1632GESA	Button (E-E monitor)	AB	28	HDECA0090GESA	Upper decoration plate	AH
8	LANGG9036GEFW	Counter memory button guide	AB	29	HPNLC1229GESA	Front panel	—
9	JBTN-1509GESA	Button (Counter memory re-setted)	AB	30	GBDYU3021GEZZ	Bottom plate	AM
10	JBTN-1510GESA	Button (Timer pre-setted)	AE	31	GFTAT1008GESK	Pre-setting cover	AT
11	JBTN-1614GESA	Button (Slow)	AB	32	GCABA3007GESA	Upper cabinet	AZ
12	PC6VU9059GESA	Fluorescent tube	AC	33	TLABM0619GEZZ	Feature label	AD
13	PC6VU9049GESA	Digirton filter	AD	34	LX-HZ3022GEFU	Upper cabinet screw	AA
14	HiNDP0536GESA	Tracking indication plate (Left)	AF	35	XEBSD40P16000	Bottom plate fixing screw (Front panel part)	AA
15	HiNDP0538GESA	Timer indication plate	AF	36	PSLDM3686GEZZ	Head amplifier shield case (Lower)	AC
16	HiNDP0537GESA	Tracking indication plate (Right)	AE	37	PSLDM3685GEZZ	Head amplifier shield case (Midway)	AE
17	JKNBK1030GESA	Knob (Tracking)	AB	38	DUNTK1455HE00	Head amplifier PWB-1	—
18	TLABH0143GEZZ	Timer pre-setting label	AA	39	DUNTK1456HE00	Head amplifier PWB-2	—
19	TLABZ0048GEZZ	Label, covering the welded trace	AA	40	PSLDM3684GEZZ	Head amplifier shield case (Upper)	AC
20	MHNG-1021GEZZ	Door hinge (Left)	AE	41	XHPSD30P06WS0	Head amplifier fixing screw	AA
21	MHNG-1019GEZZ	Door hinge (Right)	AF				

CABINET PARTS DIAGRAM

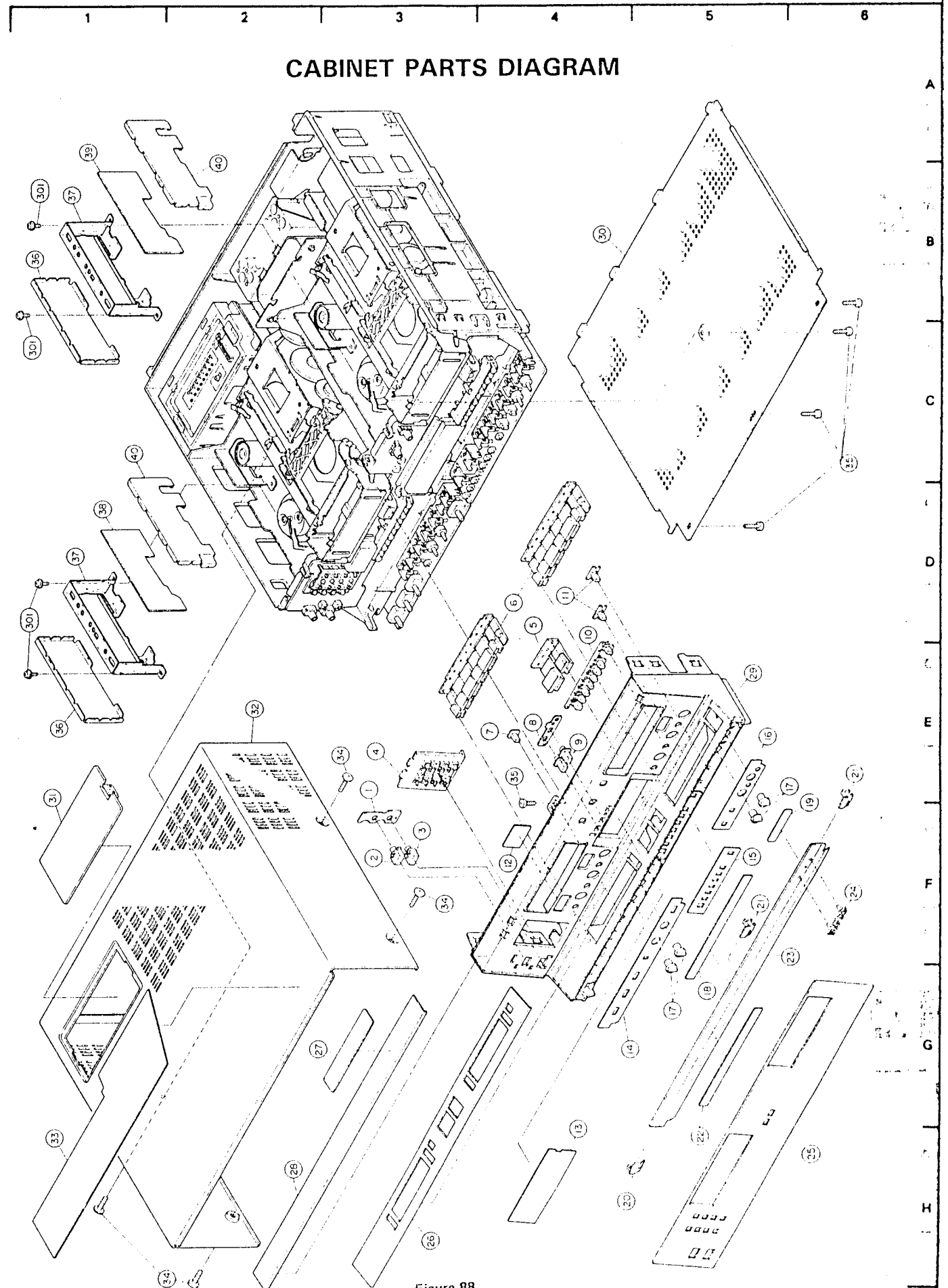


Figure 88.

CASSETTE HOUSING CONTROL SECTION PARTS

REF.NO.	PART NO.	DESCRIPTION	CODE	REF. NO.	PART NO.	DESCRIPTION	CODE
1	LHLDX3025GEZZ	Cassette housing ass'y	AK	31	LHLDZ3025GE00	Start sensor holder	AD
2	MLEVP0073GEZZ	Cassette detection lever	AE	32	LHLDZ3026GE00	End sensor holder	AD
3	MLEVF0218GEZZ	Cassette housing angle	AL	33	NBLTK0037GE00	Loading belt	AB
4	MSPRP0096GEFJ	Drive prevention spring	AA	34	QPWBF1427GEZZ	End sensor PWB	-
5	NSFTL0430GEFD	Cassette housing shaft	AC	35	QPWBF1428GEZZ	Platform PWB	-
6	LANGF9239GEFW	Cassette control frame	AK	36	RM6TM1017GEZZ	Loading motor	AV
		B ass'y		37	QSW-F0016GEZZ	Switch (Loading stater)	AD
7	LANGF9240GEFW	Upper plate	AE	38	QSW-F0017GEZZ	Switch (Ejection completed)	AD
8	LANGF9241GEZZ	Cassette control frame	AK	39	QSW-F0018GEZZ	Switch (Cassette down completed)	AD
		F ass'y					
9	LANGF9242GEZZ	Side frame ass'y	AK	40	QSW-F0019GEZZ	Mistaken erasure prevention switch	AD
10	MLEVF0219GEZZ	Cassette housing support lever	AL	41	MSPRD0061GEFJ	Phase detection lever spring	AA
11	NR6LP0042GEZZ	Cassette housing support roller	AD	42	MSPRD0062GEFJ	Spring (Holder-A)	AA
12	NR6LP0043GEZZ	Cassette housing guide roller A	AD	43	MSPRD0063GEFJ	Spring (Holder-B)	AA
13	NR6LP0044GEZZ	Cassette housing guide roller B	AD	44	MSPRD0064GEFJ	Opeing lever-B spring	AA
14	NR6LP0045GEZZ	Cassette housing guide roller C	AD	45	LHLDZ3027GEZZ	Fixing holder-cover	AE
15	NGERW1011GEZZ	Worm ass'y	AE	46	NGERH1068GEZZ	Roller engagement gear	AE
16	LHLDZ3024GEZZ	Motor holder ass'y	AC	47	QPLGN0958GEZZ	Connector	AC
17	NGERW1012GEZZ	Worm wheel	AE	48	RH-PX0053GEZZ	Photo transistor	AF
18	NGERH1065GEZZ	Engagement gear	AE	49	VS2SA937-Q/-1	Transistor	AC
19	NGERH1066GEZZ	Driver gear ass'y	AE	50	VSDTA124F/-1	Transistor	AC
20	MLEVP0074GEZZ	Phase delection lever	AE	51	VHi HD14011P-1	IC	AE
21	NGERH1067GEZZ	Roller gear ass'y	AE	52	RH-DX0142CEZZ	Diode	AB
22	MLEVP0075GEZZ	Opening lever A	AF	53	VCEAEA1HW475M	Cpacitor	AB
23	MLEVP0076GEZZ	Opening lever B	AF	54	VCKYAT1EX103J	Capacitor	AA
24	MLEVF0220GEZZ	Link	AK	55	VRD-RA2BE104J	Resistor (100k ohm)	AA
25	NR6LR0012GEZZ	Cassette delivery roller	AC	56	VRD-RA2BE473J	Resistor (47k ohm)	AA
26	MLEVP0077GEZZ	Cassette delivery roller shaft holder A ass'y	AE	57	VRD-RA2BE153J	Resistor (15k ohm)	AA
27	MLEVP0078GEZZ	Cassette delivery roller shaft holder B ass'y	AE	58	VRD-RA2BE122J	Resistor (1.2k ohm)	AA
28	PGi DM0039GEZZ	Down guide	AD	59	VRD-RA2BE152J	Resistor (1.5k ohm)	AA
29	MLEVP0079GEZZ	Mistaken insert prevention lever	AE	60	QJUM-1001CEFW	Jumper (10mm)	AA
30	GFTAC1017GESA	Cassette cover (Deck-1)	AQ	61	QJUM-3001CEFW	Jumper (7.5mm)	AA
	GFTAC1018GESA	Cassette cover (Deck-2)	AQ		CHLDX3026GE01	Cassette housing control ass'y (1)	BL
					CHLDX3026GE02	Cassette housing control ass'y (2)	BL

CASSETTE HOUSING CONTROL SECTION PARTS DIAGRAM

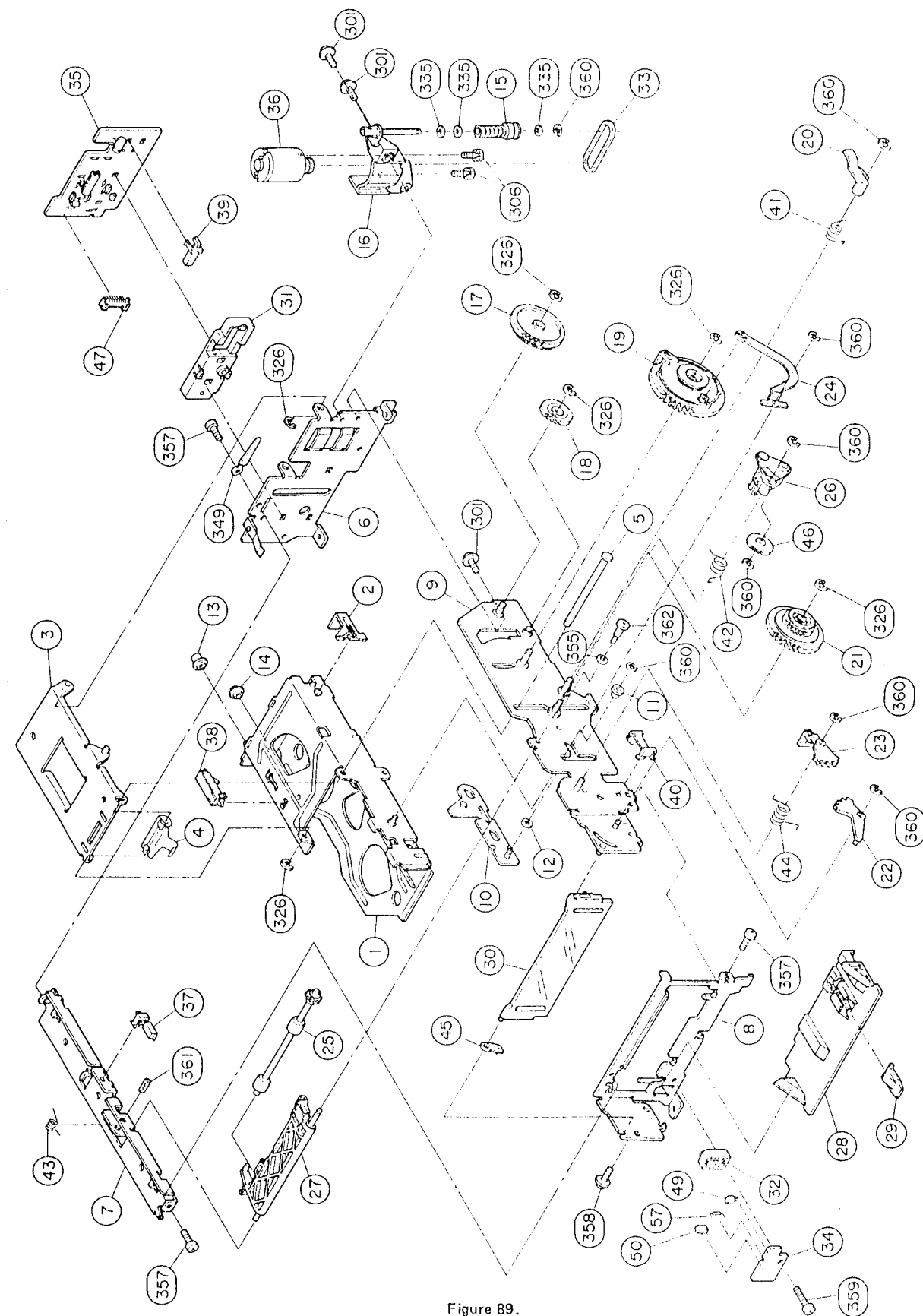


Figure 89.

SCREW, NUTS, WASHERS, AND WIRE CLAMP

REF. NO.	PART NO.	DESCRIP- TION	SIZE	CODE	REF. NO.	PART NO.	DESCRIP- TION	SIZE	CODE
301	XHPD30P06WS0	Cup tight screw	C3P+6S	AA	333	XWHJZ42-05070	Polyslider washer	4.2W7-0.5	AA
303	XHPD30P16WS0	Cup tight screw	C3P+16S	AA	334	XWHJZ52-05080	Polyslider washer	5.2W8-0.5	AB
304	XHPD30P12WS0	Cup tight screw	C3P+12S	AA	335	XWHJZ31-05054	Polyslider washer	3.1W5.4-0.5	AA
305	XBPSD26P04J00	Pan head screw	SW2.6P+4S	AA	336	LX-WZ1005GE00	Polyslider washer with cutting	1.6W4-0.5	AA
306	XBPSD30P05J00	Pan head screw	SW3P+5S	AA	337	LX-WZ1006GE00	Polyslider washer with cutting	2.5W5.4-0.5t	AA
307	XBPSD30P04J00	Pan head screw	SW3P+4S	AA	338	LX-WZ1001GE00	Polyslider washer with cutting	3.1W8-0.5t	AA
308	XBPSD30P08J00	Pan head screw	SW3P+8S	AA	341	LX-BZ3047GEFD	Screw	AA	AA
309	XBPSD30P05JS0	Pan head screw	WSW3P+5S	AA	342	LX-BZ3049GEFD	Screw	WSW3P+10S	AA
310	XBPSD30P08JS0	Pan head screw	WSW3P+8S	AA	343	XBPSD30P04J00	Screw	SW3P+4S	AA
311	XBPSD30P06J00	Pan head screw	SW3P+6S	AA	344	LX-BZ3039GEFN	Screw	AA	AA
312	XBPSD20P10000	Screw	2P+10S	AA	345	XBPN30P04000	Screw	AA	AA
315	XBPSD30P08000	Screw	3P+8S	AA	346	LX-HZ3007GEFD	Screw with washer	W3P+10S	AA
316	LX-HZ3012GEFD	Screw with washer	W3P+6S	AA	347	LX-HZ3014GEFD	Screw	WSW3P+10S	AA
318	LX-HZ3008GEFD	Screw with washer		AA	348	LX-XZ3001GEFP	Fixing screw	M2x3	AC
320	LX-XZ3013GEFP	Fixing screw	M3x5	AA	349	LHLDW1019GEZZ	Wire holder (small)		AA
322	XNFD30-24000	Nut	M3	AA	350	LHLDW9003CEZZ	Wire holder		AA
323	LHLDW1043GE00	Clamp		AA	352	XWHJZ52-15090	Polyslider washer	5.2W9.0-1.5	AB
325	XRESJ25-04000	E ring	E2.5	AA	353	XBPSD20P03000	Screw	2P+3S	AA
326	XRESJ30-06000	E ring	E3	AA	354	XBPSD20P05J00	Screw	SW2P+5S	AA
327	XRESJ40-06000	E ring	E4	AA	355	XWHJZ42-01070	Polyslider washer	4.2W7-0.13	AA
328	XWHJZ21-05045	Polyslider washer	2.1W4.5-0.5	AA	356	XHPD30P14WS0	Screw	C3P+14S	AA
329	XWHJZ31-01044	Polyslider washer	3.1W4.4-0.13	AA	357	XHBSD30P06000	Tight screw	3P+6S	AA
330	XWHJZ31-02044	Polyslider washer	3.1W4.4-0.25	AA	358	XJPSD30P06WS0			AA
331	XWHJZ31-05044	Polyslider washer	3.1W4.4-0.5	AA	359	XHBSD30P12000	Tight screw	3P+12S	AA
332	LX-WZ1009GE00	Polyslider washer	3.45W6.5-0.5	AA	360	XRESJ20-04000	E2		AA
					361	LX-PZ3011GEFJ	Spring pin		AA
					362	LX-HZ3025GEFD	Screw		AA
					363	XWHJZ31-02054	Polyslider washer	3.1W5.4-0.25	AA

SHARP
TECHNICAL MANUAL

VHS VIDEO CASSETTE RECORDER
For VC-5W20E

CONTENTS	
1. OPERATIONAL DESCRIPTION OF SERVO CIRCUIT.....	2
2. DESCRIPTION OF Y/C CIRCUIT.....	6
3. DESCRIPTION OF AUDIO CIRCUIT.....	15
4. DESCRIPTION OF TIMER/COUNTER CIRCUIT.....	17
5. DESCRIPTION OF SIMULTANEOUS PLAYBACK/RECORD PROTECTION CIRCUIT...	19
6. DESCRIPTION OF RELAY PLAYBACK CIRCUIT.....	20
7. DESCRIPTION OF DOUBLE PAUSE CIRCUIT.....	21
8. DESCRIPTION OF ONE TOUCH PLAYBACK/RECORD CIRCUIT.....	22
9. EDITING TIMER CIRCUIT.....	23
10. DESCRIPTION OF POWER ON/OFF CIRCUIT.....	25
11. TROUBLESHOOTING GUIDE.....	27
12. BLOCK DIAGRAM OF SYSTEM CONTROL CIRCUIT.....	33

1. OPERATIONAL DESCRIPTION OF SERVO CIRCUIT

1. OUTLINE

In this model VC-5W20E, the same type of digital servo circuit (RH-IX0107GEZZ) is used for both the Deck 1 and Deck 2.

Compared with the analog servo circuit, the digital servo circuit offers the following four advantages:

- (1) Simplified structure due to reduction of external parts.
- (2) Lower manufacturing cost
- (3) A small number of the control knobs employed (Record phase, D-lock and C-lock knobs are disused.)
- (4) More resistive to temperature fluctuation and secular changes

Fig. 4 is a block diagram of the servo circuit.

2. DRUM SERVO SYSTEM

The drum servo system deals with the two signals: one is the trapezoidal wave signal which is resulted from the reference oscillation signal (output FP of V oscillator) that is synchronized with the vertical sync signal (the component of video signal); another is the head switching pulse signal which is produced through a time correction with the drum motor phase detection signal (DRUM-PG). When the head switching pulse is at its rising point, the drum servo system works to sample out a slope of the trapezoidal wave signal to provide a phase control of the drum motor: this is APC operation.

From the frequency detector magnet and coil there is produced a sign wave signal (DRUM-FG), and the drum servo system makes the sign wave subject to a zero-cross detection to provide a frequency control of the drum motor: this is AFC operation. Fig. 1 is a signal timing chart of the drum servo system

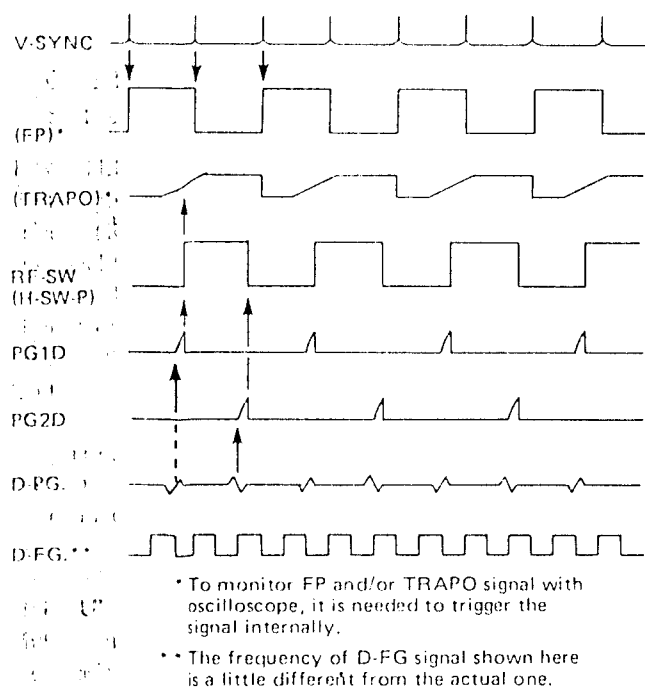


Figure 1. Signal timing chart of Drum Servo

Frequency detector and phase comparator in the drum servo system

The drum servo system is composed of a frequency detector (AFC) and phase comparator (APC). In both the frequency detector and phase comparator, there is a measurement of time difference between the reference signal and the feedback signal of AFC and/or APC, so that DC voltage corresponding to the time difference is produced.

If the time difference is found to be equivalent to the target value, the DC output becomes the central value in the output linear range.

Supposed that the target value is T_0 and the linear range is ΔT as shown in Fig. 2 the following equation is established:

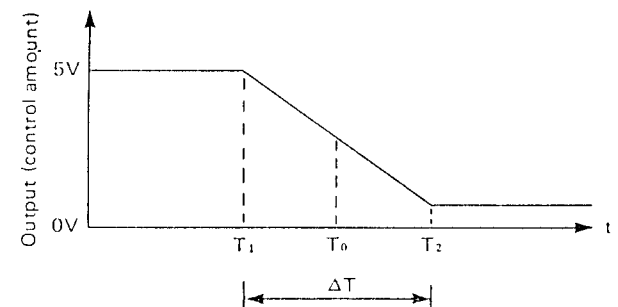


Figure 2. Relation Between Time Difference and DC output

$$T_0 - \left(-\frac{\Delta T}{2}\right) \leq t \leq T_0 + \left(-\frac{\Delta T}{2}\right) : \text{Output (PWM) proportional to the time difference}$$

$$t < T_0 + \left(-\frac{\Delta T}{2}\right) : \text{Higher output}$$

$$t > T_0 + \left(-\frac{\Delta T}{2}\right) : \text{Lower output}$$

That is, when it is $t = T_0$, The resultant output is of pulse wave modulation (PWM) signal of 50% duty.

The above-mentioned is a description of the theoretical principle of the frequency detector and phase comparator in the drum servo system, and below given are the actual operations of the drum servo circuit.

(I) Frequency detector

In the frequency detector, the DRUM-FG signal is used as a reference signal as it is, and so there is a measurement of the time difference between the first rising edge of the input signal (DRUM-FG) and its second rising edge.

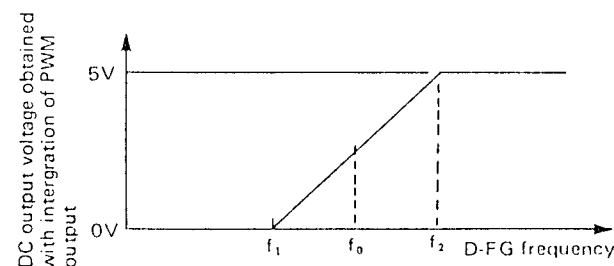


Figure 3. Detection Characteristic of AFC Frequency

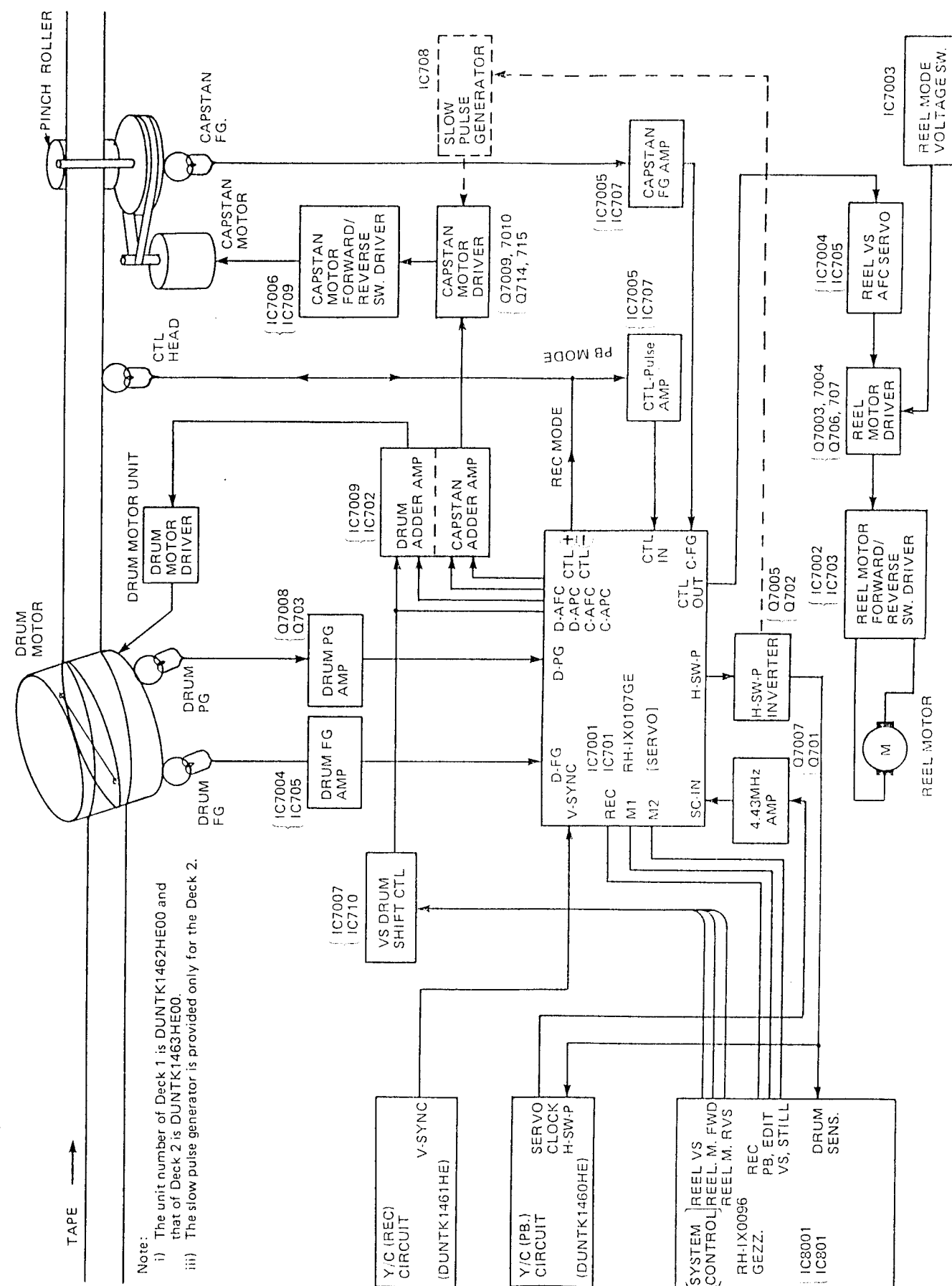


Fig. 3 shows DC voltage output which is available with integration of the input signal (DRUM-FG) frequency. For example, if the input signal is of 600Hz, the PWM output corresponding to this becomes about 69kHz.

(2) Phase comparator

In the phase comparator, there is a measurement of the time difference between the reference signal (FP) and the input signal (DRUM-PG), so that the phase difference of the drum motor is detected to produce its corresponding PWM wave signal.

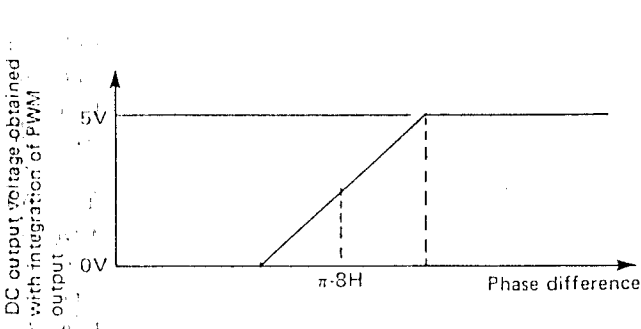


Figure 5. Comparison Characteristic of APC phase

Fig. 5 shows how the phase comparator makes a comparison between the reference signal's phase and the input signal's phase: the target value of the phase difference is set at $\pi/8H$.

The output of the phase comparator is at the central value (50% of PWM duty) in the linear range of APC operation in the following cases:

- When the unit is in the special playback mode (VS, STILL)
- When the unit is out of the linear range of APC operation.
- When the drum motor is stopped.

3. CAPSTAN SERVO SYSTEM

In the record mode, the rotation of the capstan motor is in synchronized with the phase of the reference signal (C-OSC) which is resulted from the colour subcarrier signal, and in the playback mode, it is synchronized with the phase of the reference signal available with the vertical sync signal, and with the phase of the control pulse coming from the control head.

And in the record mode, the CTL-IN and C-FG signals are subjected to a proper frequency division by the built-in programmable frequency divider circuit to provide an appropriate phase control of the capstan motor.

Fig. 6 is a signal timing chart of the capstan servo system. The frequency detector and phase comparator of the capstan servo system are fundamentally the same as those of the drum servo system. And Fig. 7 shows the block diagram of servo control LSI.

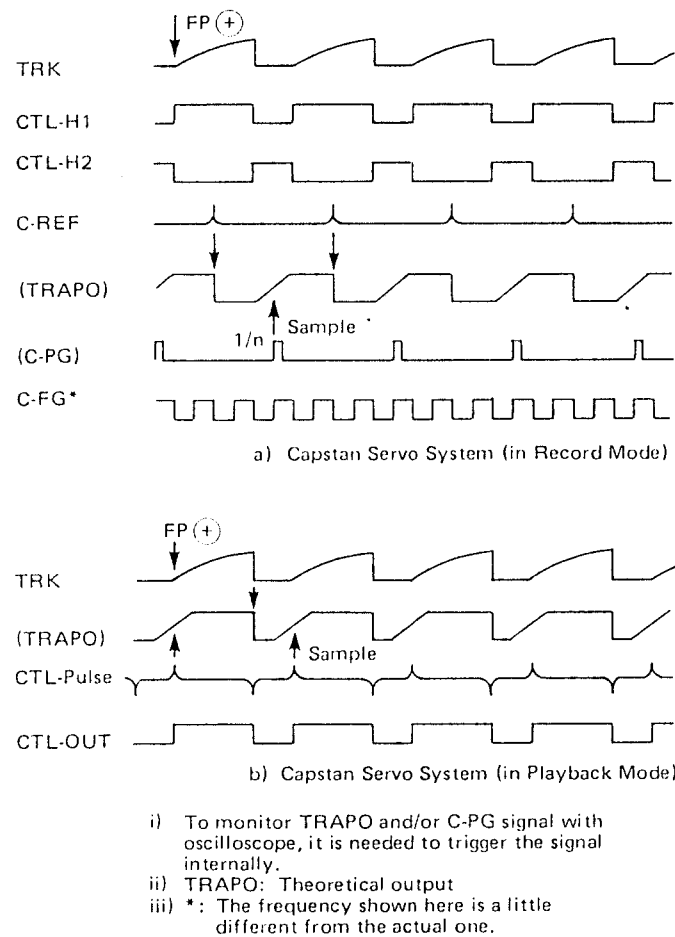


Figure 6. Signal Timing Chart of Capstan Servo System

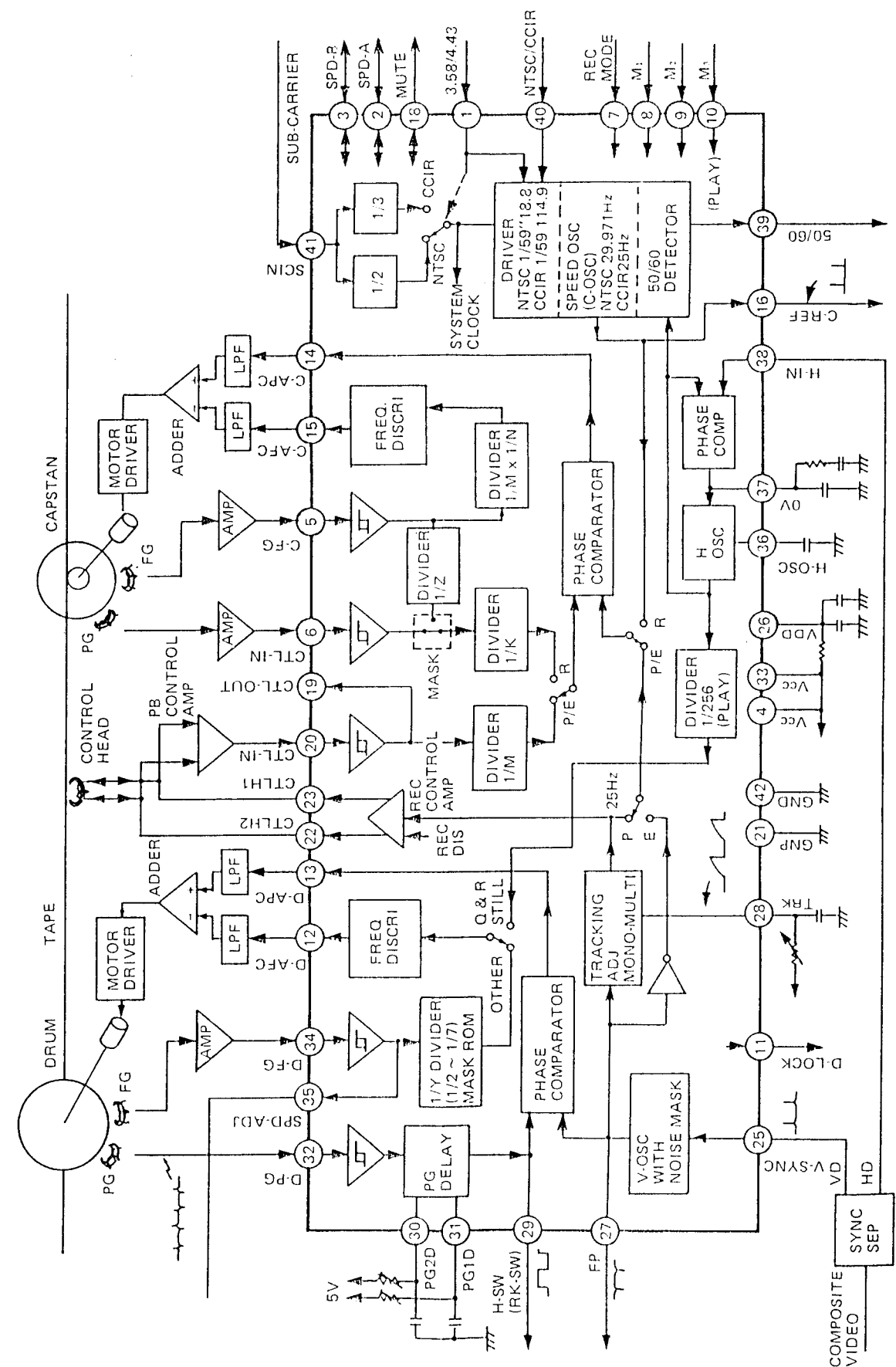


Figure 7. System Diagram of VTR Servo Control LSI

2. DESCRIPTION OF Y/C CIRCUIT

1. OUTLINE

The Y/C circuit is divided into two blocks, i.e., recording system block and playback system block: the former is to receive the tuner's signal or the external line input video signal and process it according to VHS standard format for recording it on a magnetic tape; the latter is to play back and amplify the recorded signal and to process it to produce a video signal, entering the succeeding circuits. For the model VC-5W20E, it has a special design that it is allowed to perform playback on the Deck 1 (or Deck 2) and recording on the Deck 2 (or Deck 1) simultaneously, and that the playback video signal with the Deck 1 can be recorded directly on the Deck 2 without any external connection: The latter is called an editing function.

The VC-5W20E enables recording as well as playback of any signal belonging to PAL system and ME SECAM system.

2. CIRCUITRY OPERATIONS

The Y/C circuit of the VC-5W20E is composed of the following four PWBs.

(1) PWB-C: Y (Luminance) signal/C (Chroma) signal playback processor circuit

(2) PWB-Y: Y signal/C signal record processor circuit, and video input/output selector circuit

(3) PWB-X: Record/playback amplifier circuit in Deck 2

(4) PWB-V: Record/playback amplifier circuit in Deck 1

The basic configuration of the Y/C circuit used for the VC-5W20E is almost the same as that of the conventional. So we here describe only the new circuits which are employed for this VC-5W20E.

(1) Block diagram of Y/C circuit

Fig. 10 shows a block diagram of the Y (luminance) signal processor circuit and its signal flowing path, and Fig.11 a block diagram of the C (chroma) signal processor circuit and its signal flowing path.

(2) Circuitry behaviours of each new circuit

(a) Video input/output selector circuit

There are the following three video signals that are to be handled by the record circuit of this model.

- Video signal coming from the tuner
- Video signal coming from the AUX terminal
- Video signal reproduced with the Deck 1 to be used for the editing operation

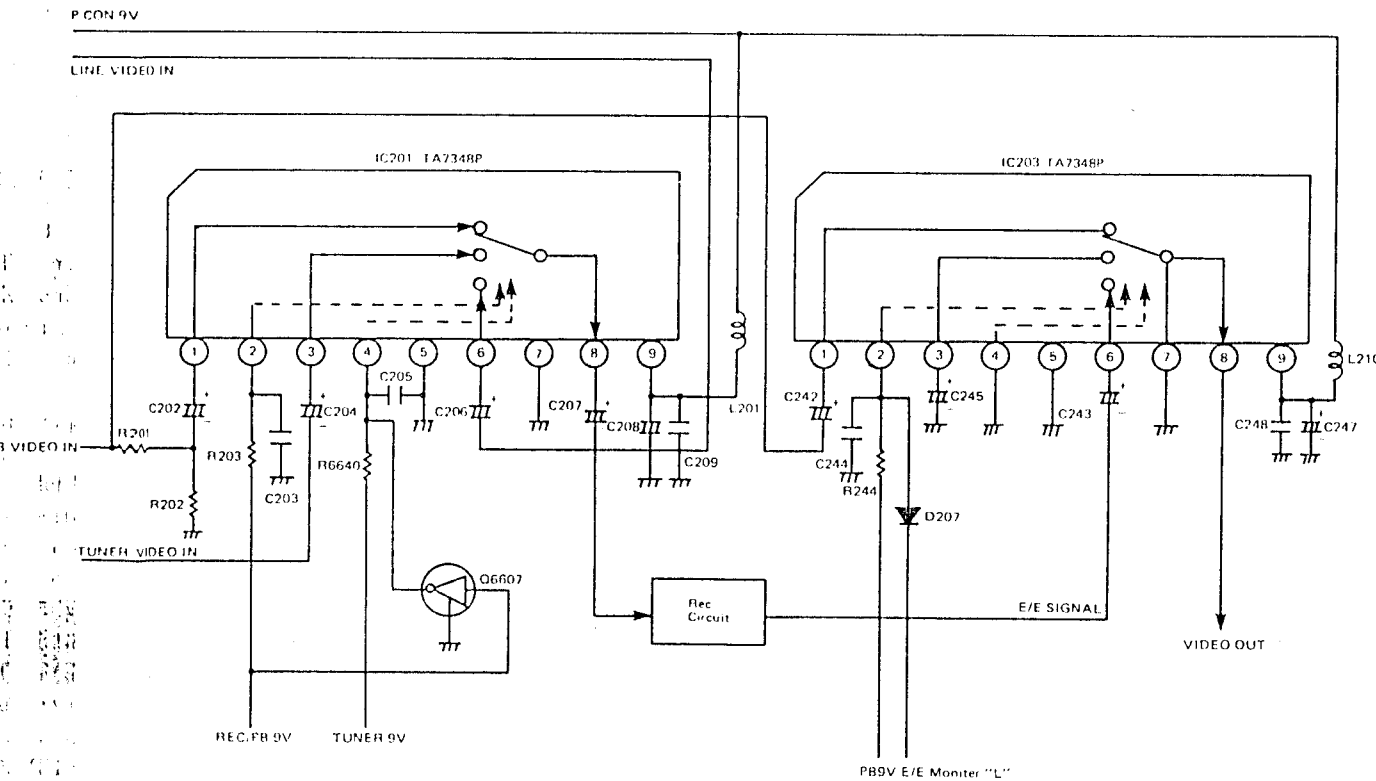
Each of these three video signals is selected according to which mode the VTR is currently placed at and to which position the input selector switch on the front panel is now

TUNER 9V	REC/PB 9V	IC201 (2) pin	IC201 (4) pin	Output mode at pin (8) of IC201
H	H	H	L	① → ⑧
H	L	L	H	③ → ⑧
L	H	H	L	① → ⑧
L	L	L	L	⑥ → ⑧

TUNER 9V: This is 9V supply line which turns on when the input selector switch (AUX ↔ TUN) on the front panel is set at TUN position.

REC/PB 9V: This is a 9V supply line which turns on when the PB → REC (EDITING) switch on the front panel is switched on.

Figure 8. Operation of Video Input Selector Circuit



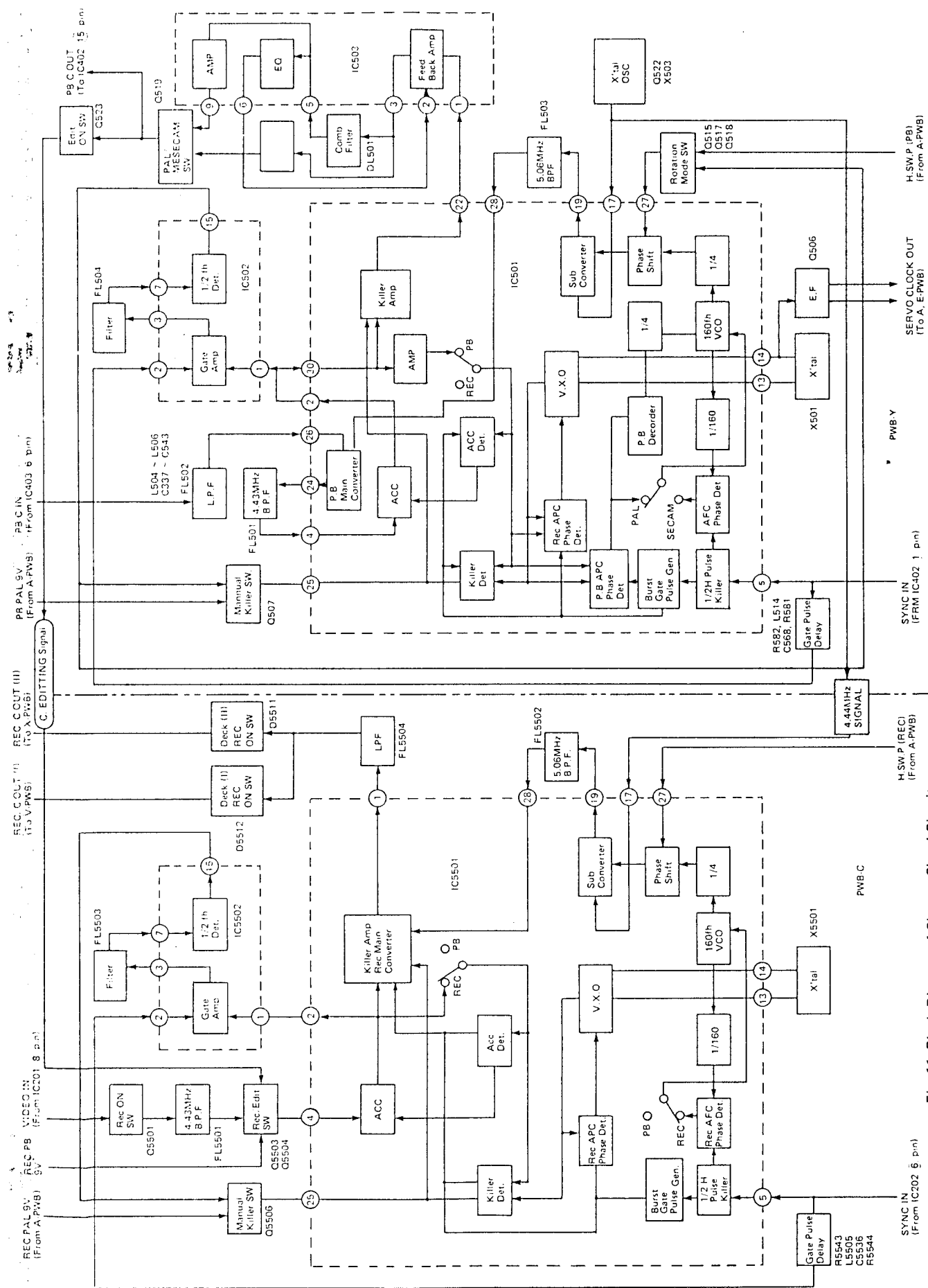


Fig. 11 Block Diagram of Chroma Signal Circuit

VTR operation mode		E/E monitor switch mode	PB 9V	E/E monitor "L"	Output mode at pin (8) of IC203	Kinds of output signals
DECK I	DECK II					
STOP	STOP	ON	L	L	(6) → (8)	E-E Signal
		OFF	L	H	(6) → (8)	E-E Signal
STOP	PB	ON	H	L	(6) → (8)	E-E Signal
		OFF	H	H	(1) → (8)	Playback signal with Deck II
STOP	REC	ON	L	L	(6) → (8)	E-E Signal
		OFF	L	H	(6) → (8)	E-E Signal
PB	STOP	ON	H	L	(6) → (8)	E-E Signal
		OFF	H	H	(1) → (8)	Playback signal with Deck I
REC	STOP	ON	L	L	(6) → (8)	E-E Signal
		OFF	L	H	(6) → (8)	E-E Signal
PB	REC	ON	H	L	(6) → (8)	E-E Signal
		OFF	H	H	(1) → (8)	Playback signal with Deck I
REC	PB	ON	H	L	(6) → (8)	E-E Signal
		OFF	H	H	(1) → (8)	Playback signal with Deck II
PB → REC (EDITING)		ON	H	L	(6) → (8)	Playback signal with Deck I
		OFF	H	H	(1) → (8)	Playback signal with Deck I

PB 9V: This is a 9V supply line which is initiated when either of Deck 1 and Deck 2 is set in playback mode.
 E/E monitor "L": This is a 0V supply line which is initiated only when the E/E monitor switch on the front panel is pushed.
 * STOP mode refers to all the modes other than REC, PB and EDITING modes.

Figure 12. Operation of Video Output Selector Circuit

placed at, and the selected video signal is processed by IC201 to be applied to the record circuit (See Fig. 9)

The video signal is applied to pin (1), (3) or (6) of IC201 each of which is under control by the signals caused at pins (2) and (4), then the resultant signal goes out of pin (8). Fig. 8 shows how the IC201 selects one of the video signals according to the operations of the control switches.

The output selector circuit is made of IC203 and its peripheral parts. It selects either the playback video signal or E-E video signal according to which mode the VTR is currently placed at and to which position the E-E monitor switch is now placed at, then delivers it to the succeeding circuits. Fig. 12 shows how the IC203 behaves according to the operations of the control switches.

(b) Normal record mode/editing mode selector circuit for luminance signal

• In normal record mode:

Y (Luminance) signal coming from pin (8) of IC202 is applied to Q204, and this transistor turns on as it is then given DC bias of about 3.7V at its base. Then the Y signal goes out of the emitter of Q204 and is sent to pin (16) of IC202. At this time, Q213 is given DC bias of about 7V at its base and there is caused a reverse bias between its base and emitter, so that it turns off.

• In editing mode:

The signal of REC/PB 9V which is connected with the base of Q214 becomes High level, and Q214 turns on and

R260 is grounded. Then, there is caused about 2.1V at the base of Q213, and Q213 turns on to allow the Y signal coming from the playback circuit to be supplied to pin (16) of IC202; at the time, Q204 is given a reverse bias and it turns off.

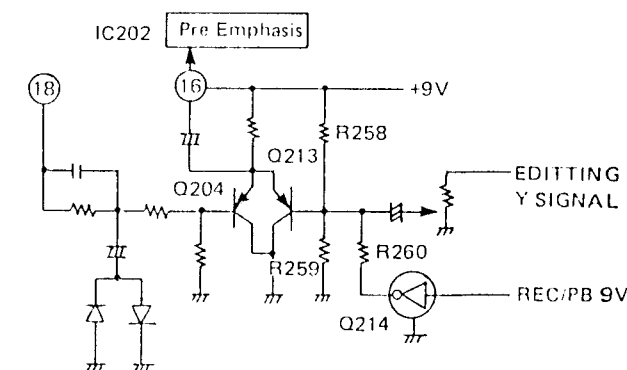


Figure 13

(C) Playback FM signals selection circuit

When the Deck 1 is set at the playback mode, the signal of PB 9V (1) becomes High level and the input signal at pin (3) of IC403 is allowed to go out of pin (6). When the Deck 2 is set at the playback mode, the signal of PB 9V (1) becomes Low level and the input signal at pin (1) is allowed to go out of pin (6).

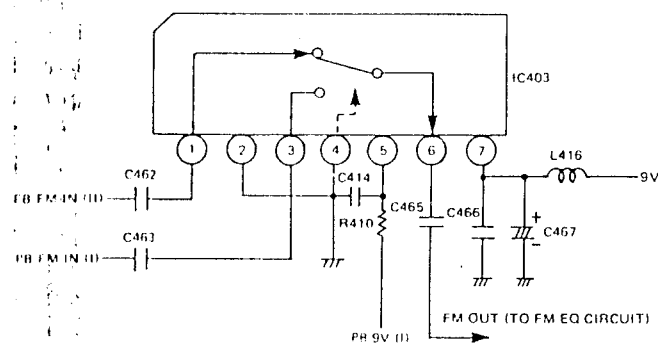


Figure 14

(d) picture tone control circuit (See Fig. 15)

The Y signal coming from the playback circuit is applied via the de-emphasis circuit to the base of Q422, then it is amplified by the differential amplifier made of Q422, Q420 and Q421. The Y signal is then sent to the peaking circuit in connection with the collector of Q421 where only its high-frequency component is picked up to go out of the collector of Q422. The high-frequency component is further differentiated by C453 and R498 and applied to the slice circuit made of D410 and D411 where its noise component is removed, and it is fed via C454 to Q423.

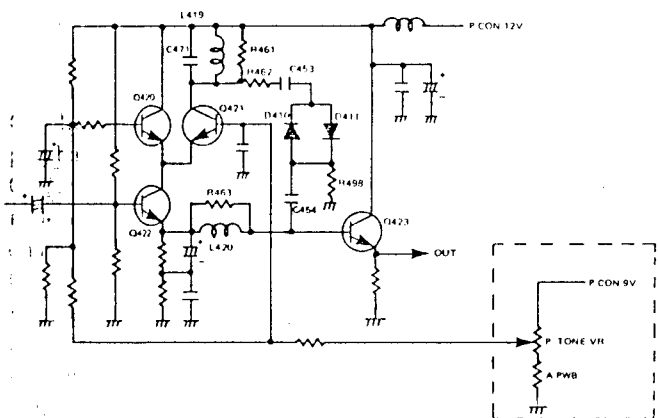


Figure 15. Picture Tone Circuit

On the other hand, a part of the Y signal coming from the playback circuit is allowed to go out of the emitter of Q422 without such amplification as mentioned above, and it is applied to R463 and L420 where its high-frequency characteristic is made flat, then is delivered to the base of Q423.

In this way, it is at the base of Q423 that there is a mixing of the two signal, i. e., the original Y signal with its high-frequency characteristic made flat and the high-frequency component picked up out of the original Y signal.

The picture tone control knob on the front panel is used to have the amplification gain of Q420 and Q421 varied to control the mixing of the high-frequency component into the original Y signal to obtain better picture quality.

Fig. 16 shows the waveform at each point of the picture tone control circuit.

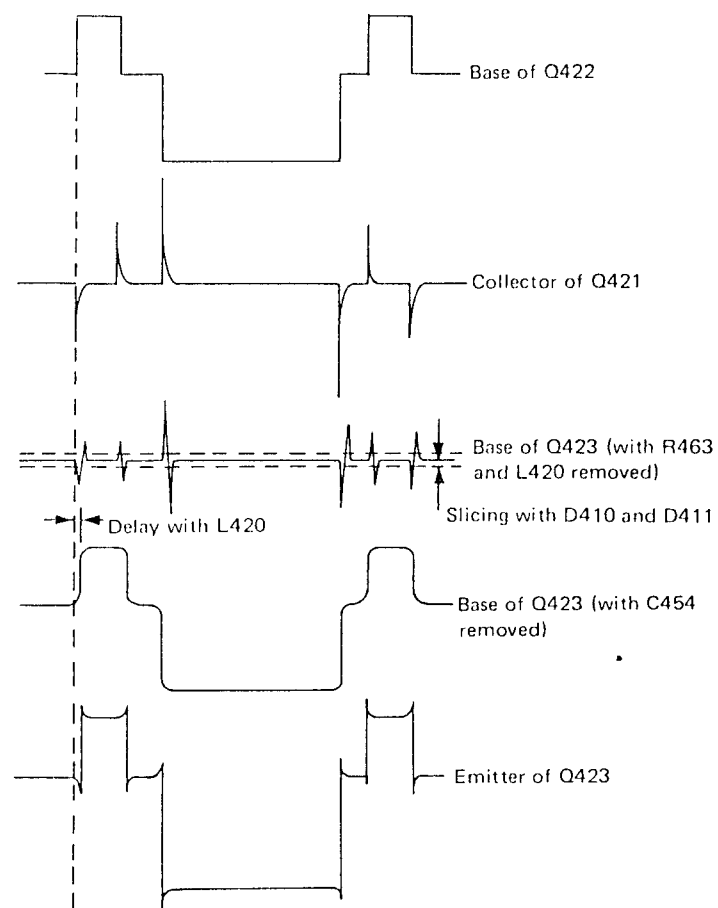


Figure 16

(e) Feedback type comb filter circuit (See Fig. 17)

- In playback mode of PAL system:

The playback chroma signal coming from pin ② of IC501 is applied via R577 to pin ① of IC503. There is a feedback amplifier between pins ① and ③ of IC503: pin ② is the terminal to receive the feedback chroma signal. Going out of pin ③ of IC503, the chroma signal is applied to the comb filter DL501 whose output will be sent to pin ⑤ of IC503.

There is an equalizer amplifier L520 and this amplifier works to make a phase matching between the original signal and feedback signal; after that, the chroma signal goes out of pin ⑥ and is fed back to pin ② of the feedback amplifier.

In this way, the crosstalk component of playback chroma signal is mostly removed by the comb filter DL501.

- In editing mode:

In this mode, the power of 9V is supplied via D513 to Q524. With Q524 turned on, there is no signal feedback loop from pin ⑥ to pin ② of IC503; this means that in the editing mode the chroma signal is filtered out by the comb filter but it is not fed back to the amplifier between pins ① and ③. This is because the chroma signal will be deviated vertically for the period of 4H if subjected to the feedback operation mentioned above, resulting in a poor dubbing of pictures.

- In playback mode of ME SECAM system:

In this mode, the power of 9V is applied via D512 to Q524. With Q524 turned on, there is no signal feedback loop from pin ⑥ to pin ② of IC503, and the feedback amplifier between pins ① and ③ works as an ordinary amplifier.

Going out of pin ③ of IC503, the chroma signal is applied to the correction circuit of ME SECAM frequency characteristic in which the signal component which has been attenuated in the filters of the record and play-

back circuits is regained so as to reduce the possibility of the picture becoming poor in chrominance.

The chroma signal going out of the correction circuit is sent to the base of Q519.

In playback of ME SECAM system signal, there is caused about 6V at the base of Q519, and Q519 turns on so that the transistor in connection with pin ⑨ of IC503 turns off. Then the chroma signal goes out of the emitter of Q519 and is applied to pin ⑮ of IC403 (Y/C mixer circuit).

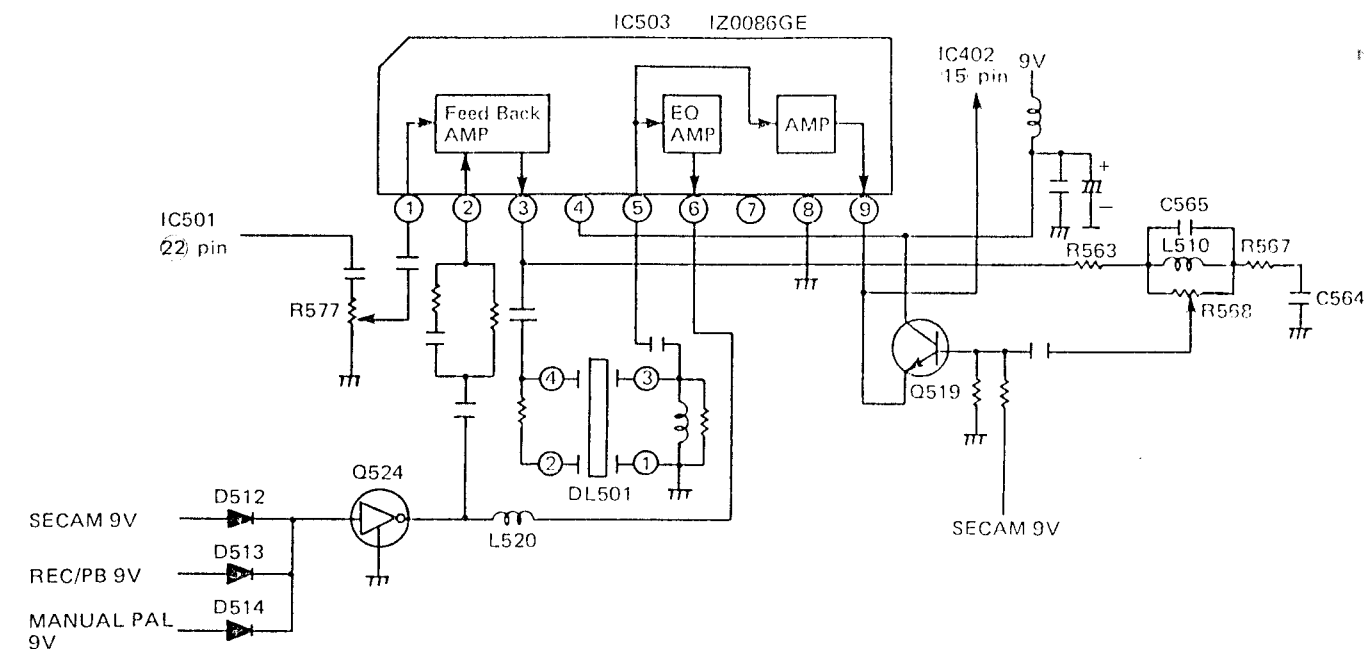


Figure 17. Feedback Type Comb Filter Circuit

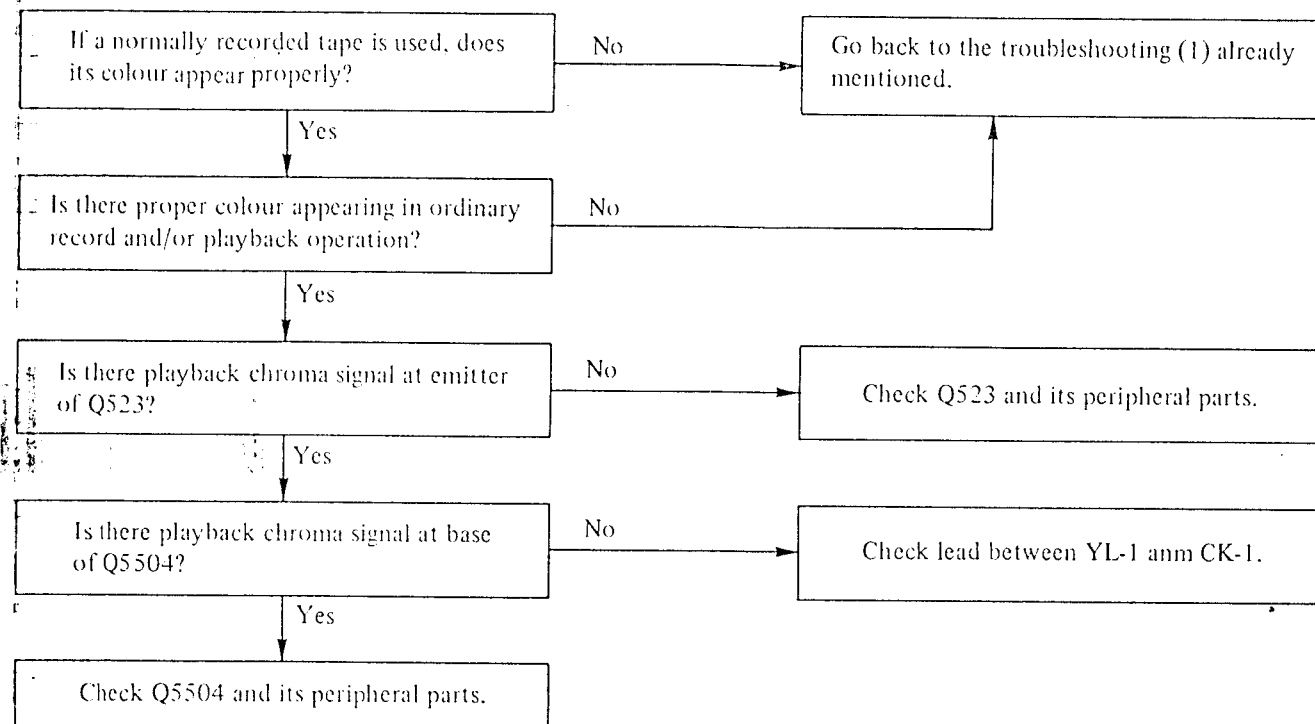
(1) No colour appears on screen in record mode and/or playback operation
(but with Y signal appearing normally)



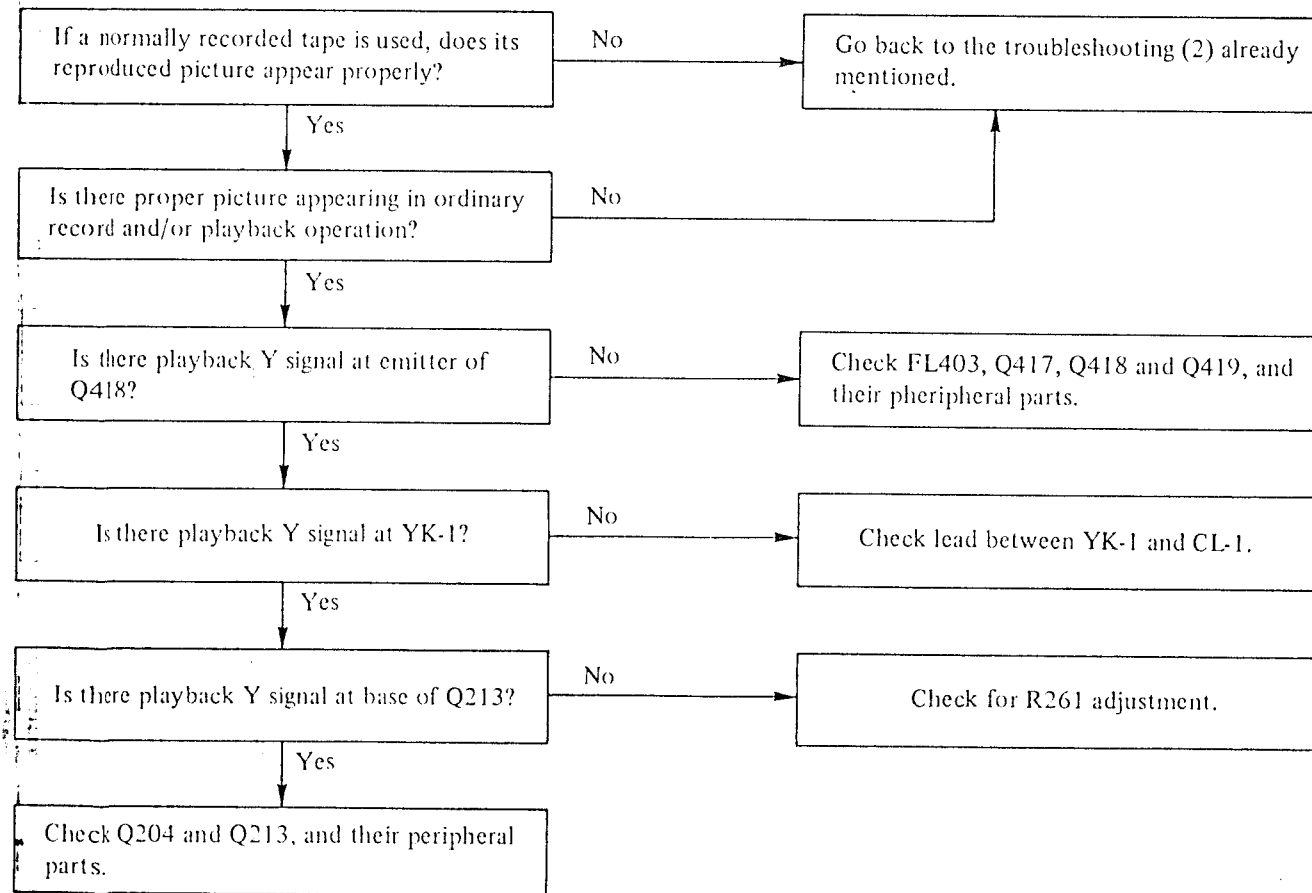
(2) No picture appears on screen in record and/or playback operation



(3) No colour appears on screen with use of edited tape



(4) No picture appears on screen with use of edited tape



3. DESCRIPTION OF AUDIO CIRCUIT

1. OUTLINE

The audio circuit is divided into two blocks, i. e., recording system block and playback system block; the former is to receive the tuner's signal or the external line-in audio signal and process it according to VHS standard format for recording it on a magnetic tape through the audio head; the latter is to playback and amplify the recorded signal through the audio head and to process it to produce an audio signal, entering the succeeding circuits. For the model VC-5W20E, it has a special design that it is allowed to perform playback on the Deck 1 (or Deck 2) and recording on the Deck 2 (or Deck 1) simultaneously, and that the playback audio signal with the Deck 1 can be recorded directly on the Deck 2 without any external connection; the latter is called an editing function.

2. CIRCUITRY OPERATIONS

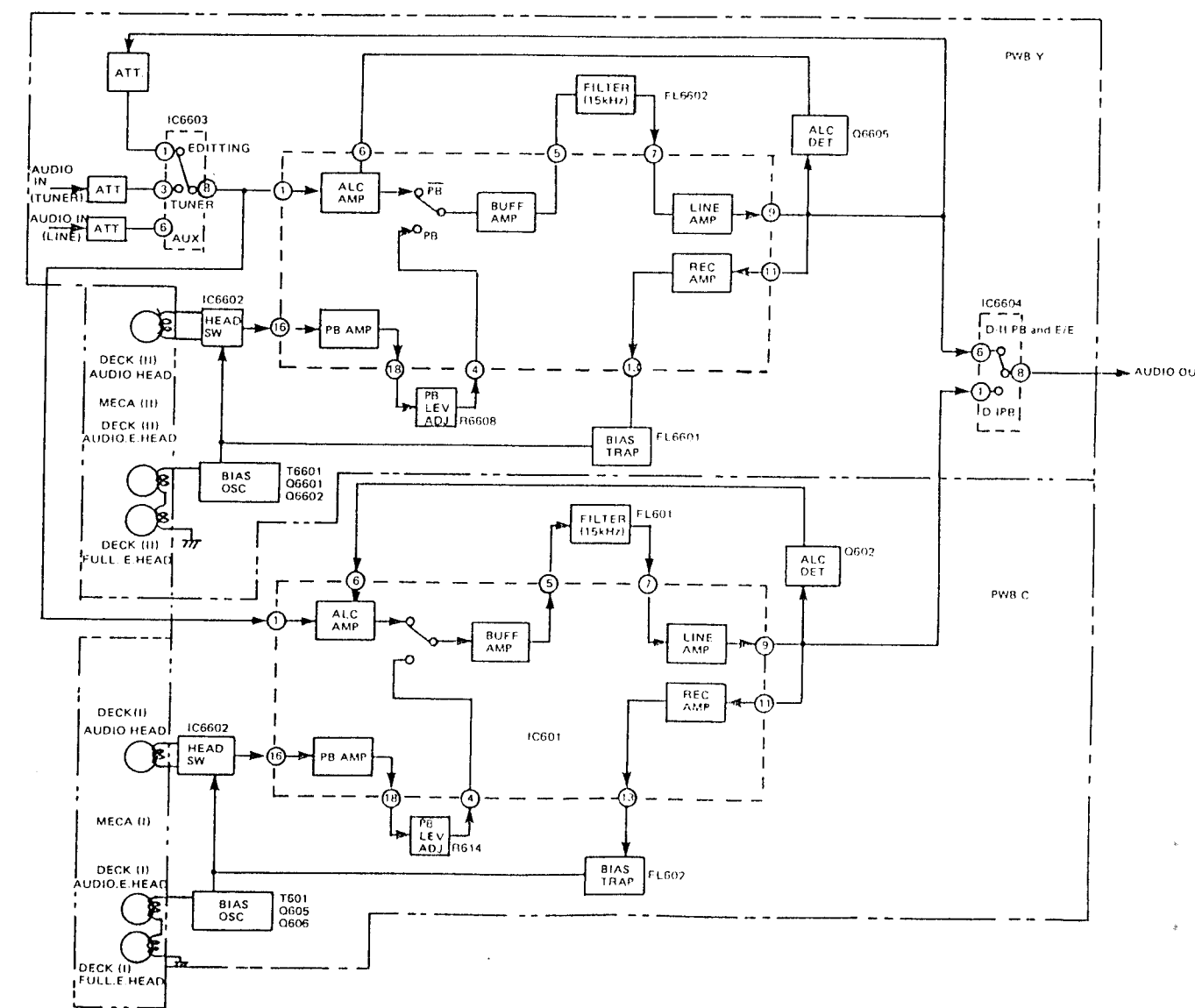
The audio circuit of the VC-5W20E is composed of the following two PWBs.

- (1) PWB-C: Audio record/playback circuit, bias oscillator circuit in Deck 1
- (2) PWB-Y: Audio record/playback circuit, bias oscillator circuit in Deck 2, and audio input/output selector circuit.

The basic configuration of the audio circuit used for the VC-5W20E is almost the same as that of the conventional VC-471E. So we here describe only the input/output selector circuit which is newly employed for this VC-5W20E.

(1) Block diagram of audio circuit

Fig. 18 shows a block diagram of the audio circuit and signal flowing path.



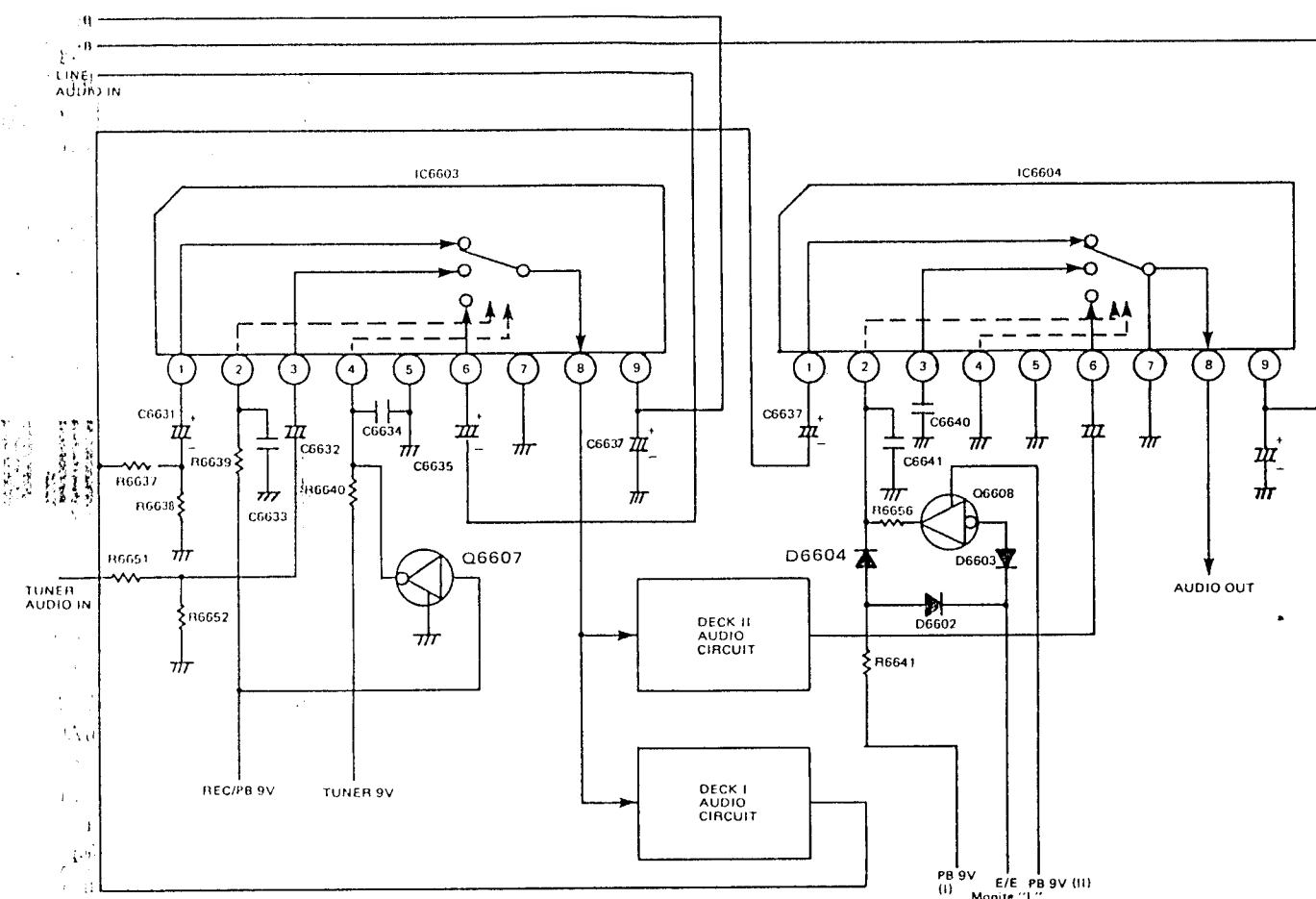


Figure 19. Audio Input/Output Selector Circuit

VTR operation mode		E/E Monitor SW mode	PB 9V (I)	PB 9V (II)	E/E Monitor "L"	IC6604 (2) pin	Output mode at pin (8) of IC6604	Kinds of output signals
DECK I	DECK II							
STOP	STOP	ON	L	L	L	L	(6) → (8)	E-E signal
		OFF	L	L	H	L	(6) → (8)	E-E signal
STOP	PB	ON	L	H	L	H	(1) → (8)	E-E signal
		OFF	L	H	H	L	(6) → (8)	Playback audio signal with Deck I
STOP	REC	ON	L	L	L	L	(6) → (8)	E-E signal
		OFF	L	L	H	L	(6) → (8)	E-E signal
PB	STOP	ON	H	L	L	L	(6) → (8)	E-E signal
		OFF	H	L	H	H	(1) → (8)	Playback audio signal with Deck I
REC	STOP	ON	L	L	L	L	(6) → (8)	E-E signal
		OFF	L	L	H	L	(6) → (8)	E-E signal
PB	REC	ON	H	L	L	L	(6) → (8)	E-E signal
		OFF	H	L	H	H	(1) → (8)	Playback audio signal with Deck I
REC	PB	ON	L	H	L	H	(1) → (8)	E-E signal
		OFF	L	H	H	L	(6) → (8)	Playback audio signal with Deck II
PB → REC		ON	H	L	L	L	(6) → (8)	Playback audio signal with Deck I
		OFF	H	L	H	H	(1) → (8)	Playback audio signal with Deck I

PB 9V (I): This is a 9V supply line which is initiated when the Deck 1 is placed in playback mode.
 PB 9V (II): This is a 9V supply line which is initiated when the Deck 2 is placed in playback mode.
 E/E monitor "L": This is a 0V supply line which is initiated only when the E/E monitor switch on the front panel is pushed.
 * Stop mode refers to all the modes other than REC, PB and EDITING modes.

Figure 21. Operation of Audio Output Selector Circuit

(2) Circuitry behaviours of new circuit

a. Audio input/output selector circuit

There are the following three audio signals that are to be handled by the record circuit of this model.

- Audio signal coming from the tuner
- Audio signal coming from the AUX terminal
- Audio signal reproduced with the Deck 1 to be used for the editing operation.

Each of these three audio signals is selected according to which mode the VTR is currently placed at and to which position the input selector switch on the front panel is now placed at, and the selected video signal is processed by IC6603 to be applied to the record circuit (See Fig. 19).

The audio signal is applied to pin (1), (3) or (6) of IC6603 each of which is under control by the signals caused at pins (2) and (4). Fig. 20 shows how the IC6603 selects one of the audio signals according to the operations of the control switches.

The output selector circuit is made of IC6604 and its peripheral parts. It selects either of the audio signals on the

Deck1 and Deck 2 according to which mode the VTR is currently placed at and to which position the E-E monitor switch is now placed at, then delivers it to the succeeding circuits. Fig. 21 shows how the IC6604 behaves according to the operations of the control switches.

TUNER 9V	REC/PB 9V	IC6603 (2) pin	IC6603 (4) pin	Output mode at pin (8) of IC6603
H	H	H	L	(1) → (8)
H	L	L	H	(3) → (8)
L	H	H	L	(1) → (8)
L	L	L	H	(6) → (8)

TUNER 9V: This is a 9V supply line which is initiated when the input selector switch (AUX ↔ TUN) on the front panel is set at TUN position.
 REC/PB 9V: This is a 9V supply line which is initiated when the PB → REC (EDITING) switch is turned on.

Figure 20. Operation of Audio Input Selector Circuit

4. DESCRIPTION OF TIMER/COUNTER CIRCUIT

1. OUTLINE

In the VC-5W20E, IC5001 (VHIM66503SL-1) is used as a 2-week, 1-program double timer/electronic counter and it is effective with the Deck 2 alone but not with the Deck 1.

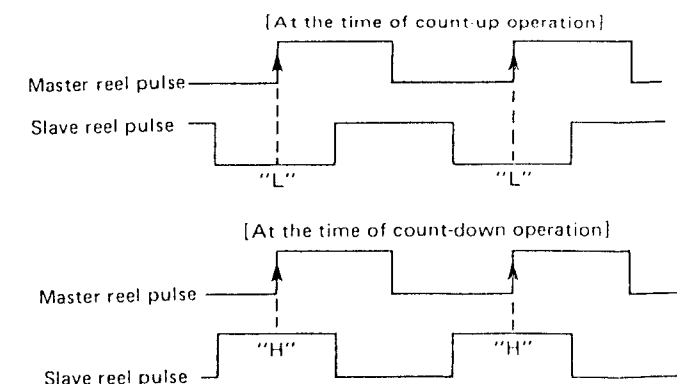


Figure 22.

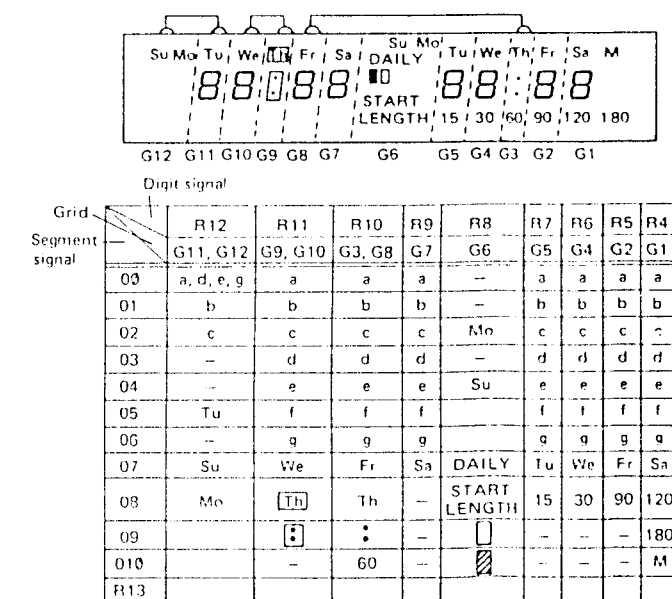


Figure 23. Specifications of Digitron with 2-Week, 1-Program Timer/Electronic Counter

2. CIRCUITRY OPERATIONS

For the functions of the timer circuit, refer to Fig. 24 which is a block diagram showing how to make key entry operations and to Fig. 23 which shows how the segments of the digitron tube are arranged to cause an information on the display panel.

The electronic counter is interconnected with the take-up reel disk. With rotation of the take-up reel disk, there are produced two pulses which are different with each other by 90° in phase: one is called a master reel pulse and another

a slave reel pulse. They are applied to the transistors Q809 and Q810 located at PWB-E (DUNTK1463HE00) in the Deck 2 where they are shaped in waveform, then each of them is supplied to pin 32 (for the master reel pulse) and pin 33 (for the slave reel pulse) of the timer IC.

The counter increases the number one by one every time the slave reel pulse becomes Low level when the master reel pulse is at its rising edge. And it decreases the number one by one every time the slave reel pulse becomes High level when the master reel pulse is at its falling edge.

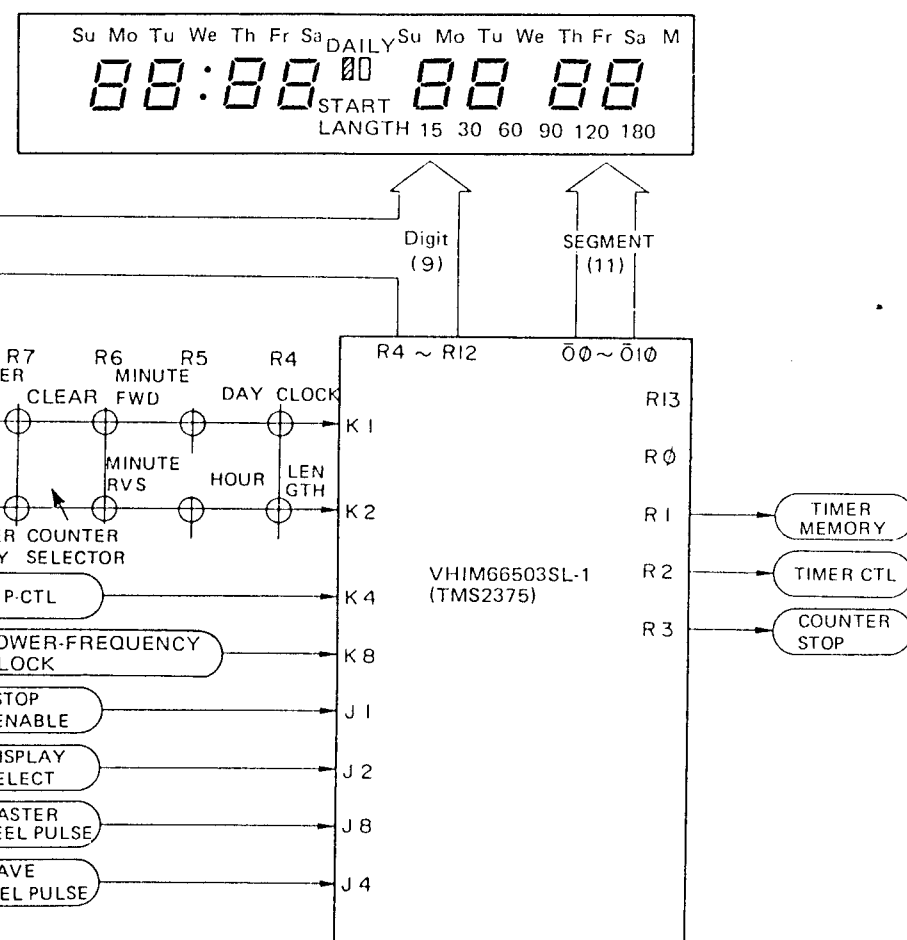


Figure 24.

5. DESCRIPTION OF SIMULTANEOUS PLAYBACK/RECORD PROTECTION CIRCUIT

1. OUTLINE

The VC-5W20E is provided with two decks (Deck 1 and Deck 2), and it is designed for each Deck to get in playback and/or record mode independently but it is not allowed for both Decks to get in playback and/or record mode simultaneously.

2. CIRCUITRY OPERATIONS

The same type of protection circuit is used for playback and record operations, and so we here describe only the simultaneous playback protection circuit.

(1) When both playback keys of Deck 1 and Deck 2 are pushed almost simultaneously while both Decks are in stop mode:

Even though there is a simultaneous pushing of two keys, actually, there is a minute time difference of even a several milliseconds between the keys to be pushed.

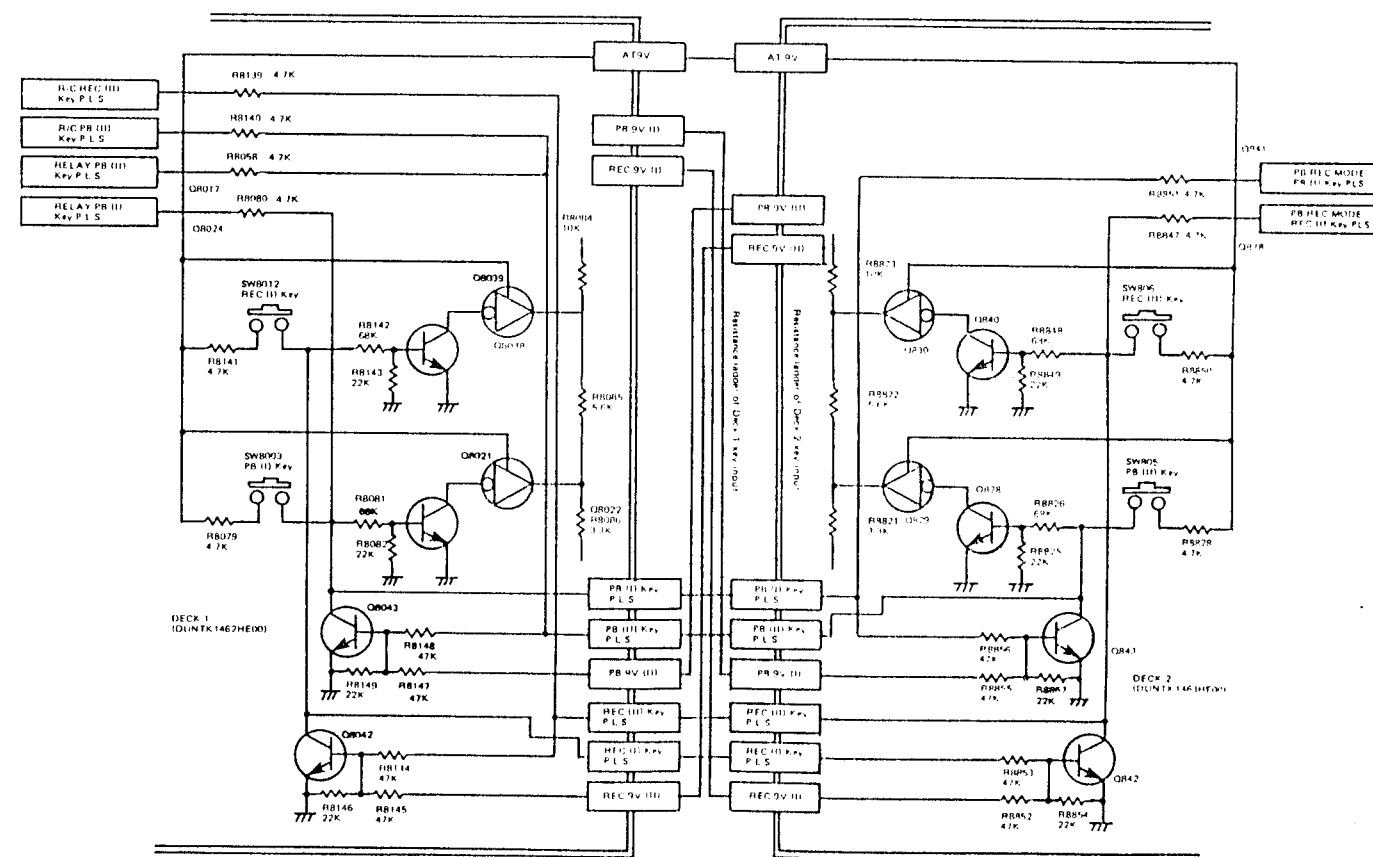
For example, if the playback (I) key is pushed a little earlier than the playback (II) key, Q843 (for the Deck 1) turns on earlier than Q8043 (for the Deck 1) does; therefore, even if the playback (II) key is pushed, the resultant pulse from SW805 is muted to Low level because of Q8043 turning on. Then there is no current supply to the base of Q8043 so that the Deck 1 alone is allowed to get in playback mode.

The same holds true of the reverse case.

(2) When the playback (II) key is pushed while the Deck 1 is in playback mode or vice versa:

For example, if the playback (II) key is pushed while the Deck 1 is in playback mode, Q843 is kept turned on because the line PB 9V (I) is then at High level. Accordingly, the resultant pulse with the playback (II) key pushed is muted to Low level so that the Deck 2 is prevented from getting in playback mode.

The same holds true of the reverse case.



8. DESCRIPTION OF ONE TOUCH PLAYBACK/RECORD CIRCUIT

1. OUTLINE

The model VC-5W20E is provided with an editing function by which you can get the Deck 1 and Deck 2 in playback mode and record mode respectively at the same time, simply by pushing the PB. REC key (SW810) on the front panel.

With the editing mode established, when the tape of the Deck 1 (or 2) reaches its end, this Deck enters auto rewind mode, while the Deck 2 (or 1) is then automatically stopped even if the tape of the Deck is still left.

The PB. REC signal (High level) produced by this circuit is used to let the audio/video input switch and chroma circuit operate meeting the editing function.

2. CIRCUITRY OPERATIONS

Fig. 28 is a block diagram of the one-touch playback/record circuit.

The pulse caused with the PB. REC key pushed is applied to R877, R878 and C813 in which it is integrated, and the integrated pulse is sent to Schmitt circuit made of IC805 (a) and (b) where it is shaped to become a square wave signal. Then the signal is applied to the buffer transistors Q820, Q838 and Q841 where it is divided into PB (I) key pulse and REC (II) key pulse, both entering the respective system control LSIs of both Decks: in this way, the Deck 1 and Deck 2 are allowed to get in playback mode and record mode respectively.

The output pulse of IC809 (a) is latched to the R-S (Reset-Set, type) flip flop circuit made of IC806 (a) and (b), and it is sent to the buffer circuit made of IC805 (d) and (e) and

Q819 and goes out as PB. REC 9V signal entering the system control LSI. When the Deck 1 gets out of playback mode or the Deck 2 gets out of record mode, the RESET (High level) signal is applied to the R-S flip flop circuit to let it reset so that the PB. REC 9V signal no longer enters the system control LSI: IC807 (a) and IC805 (c) judges that the Deck 1 has got out playback mode or that Deck 2 has got out of record mode.

When there is TIMER LED (II) signal, the output resulted from pushing the PB. REC key is muted by Q839, and under the condition of (CST DOWN(I)). (CST DOWN(II)). (REC TIP(II)). it is also muted by IC812 (a) and D812. By this muting, it is avoided that the Deck 1 alone gets in playback mode without the Deck 2 entering record mode or that the Deck 2 alone gets in record mode without the Deck 1 entering playback mode.

As the editing operation proceeds, when the tape of either Deck reached its end, END SENS (I) or (II) signal is caused and it is applied to IC807 (b) or (c), then is sent to IC809 (b) (monostable multivibrator) which will produce a pulse of about 500msec. In combination with the END SENS (I) or (II) signal (High level), this pulse is used to let the system control LSI work so as to stop recording of the Deck 2 or playback of the Deck 1.

Each END SENS signal stays at High level for about 100 msec, the duration of which is decided by the charge/discharge time constant afforded by D846 to C815 and D849 to C817. Then the END SENS (I) or (II) is finally applied to IC808 (a) or (b) which will then produce SENS STOP (II) or (I) signal (High level): thus the system control LSI is allowed to have recording of Deck 2 or playback of Deck 1 stopped.

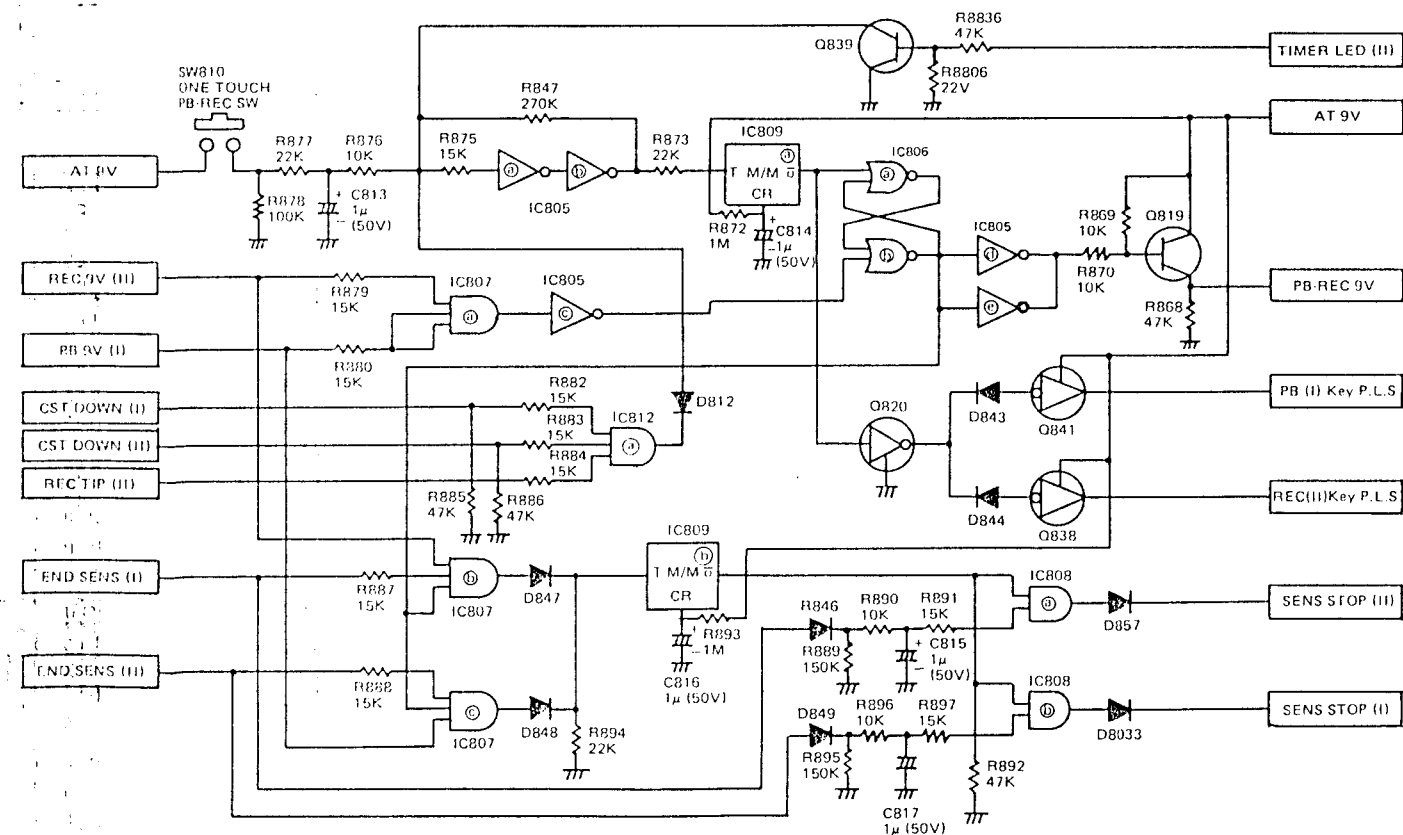


Figure 28. Block Diagram of One-Touch Playback/Record Circuit

9. EDITING TIMING CIRCUIT

1. OUTLINE

While the unit is in record mode, when the pause key is pushed the unit rewinds the recorded tape for about two seconds. And when the pause key is pushed a second time to release it, the unit gets in playback mode in which the system control LSI is allowed to make a phase control of the capstan motor, and after that the unit again enters record mode.

As the result of this editing operation, the unit causes no blanks between each frame when the tape recorded with editing process will be played back.

2. CIRCUITRY OPERATIONS

The editing timing circuit is connected with the system control LSI which controls the timing in which the mechanism and video head are allowed to begin recording operation.

○ Servo system:

There is caused a voltage (about 5V) at either pin (7) or pin (8) or the digital servo IC (IC7001), according to which the unit is allowed to get in record mode or playback mode.

and at the same time the capstan motor's speed is set at the value to meet each mode, thereby to decide the transport amount of the tape.

Figs. 30 and 31 show the timing chart of the signals caused by the system control LSI for the editing operation.

○ Capstan system

Fig. 29 shows how the control pulse recorded on a tape varies with the time lapse during the editing operation. While the unit is in record mode, the control pulses recorded at the lower part of a tape. When the pause key is then pushed, High-level voltage is applied to pin (8) of IC7001 so that the unit gets in playback mode. Then the tape is rewound for about two seconds and the unit enters record-pause mode.

And when the pause key is pushed a second time to release it the pinch roller is pressed against the capstan shaft to allow the unit to get in playback mode for about one second, in which the system control LSI makes a phase matching of the capstan motor. After that, the unit returns to record mode so that the control pulse is gain produced and recorded on the tape.

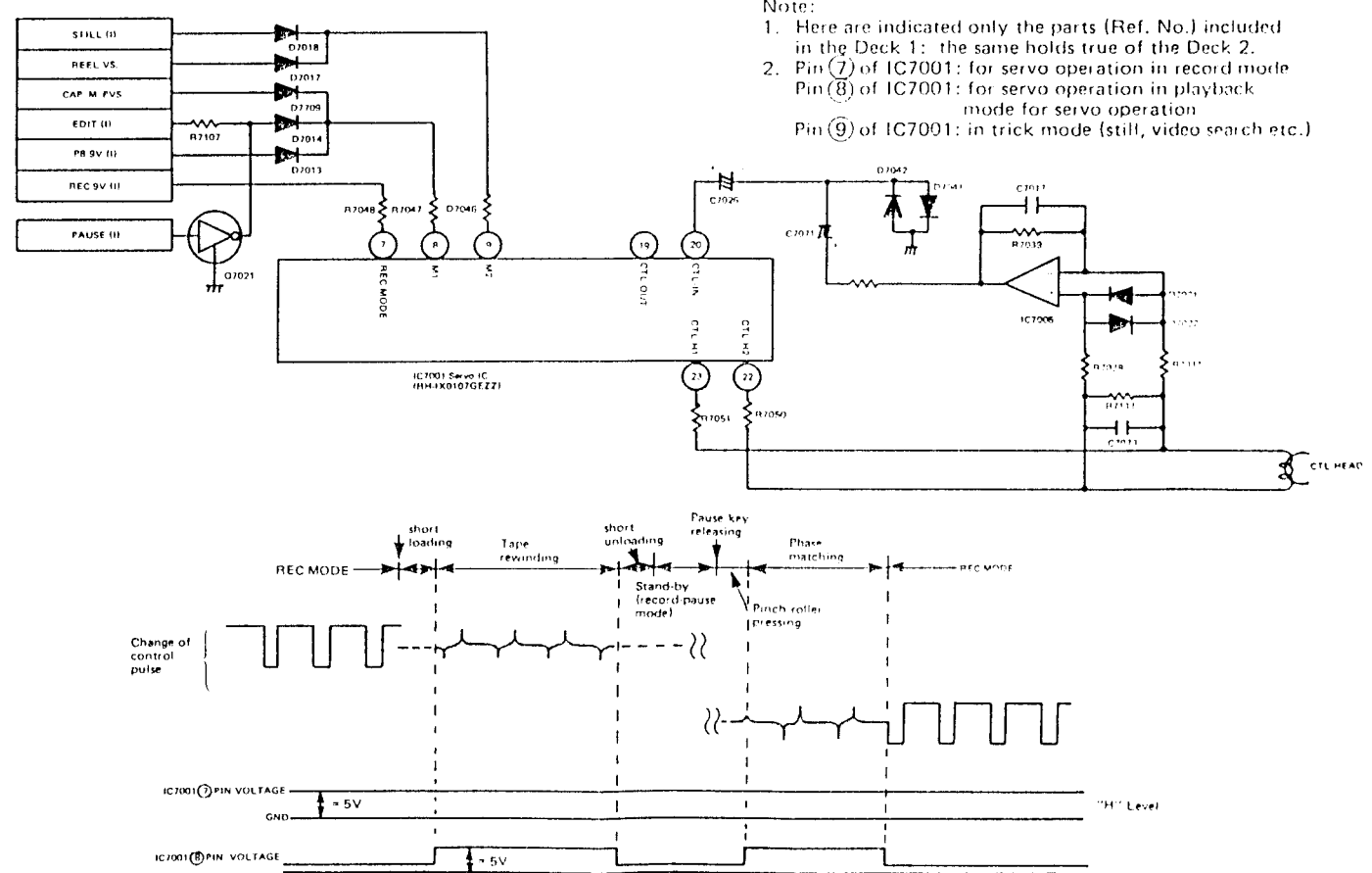


Figure 29. Editing Timing Circuit

(REC PAUSE → REC)

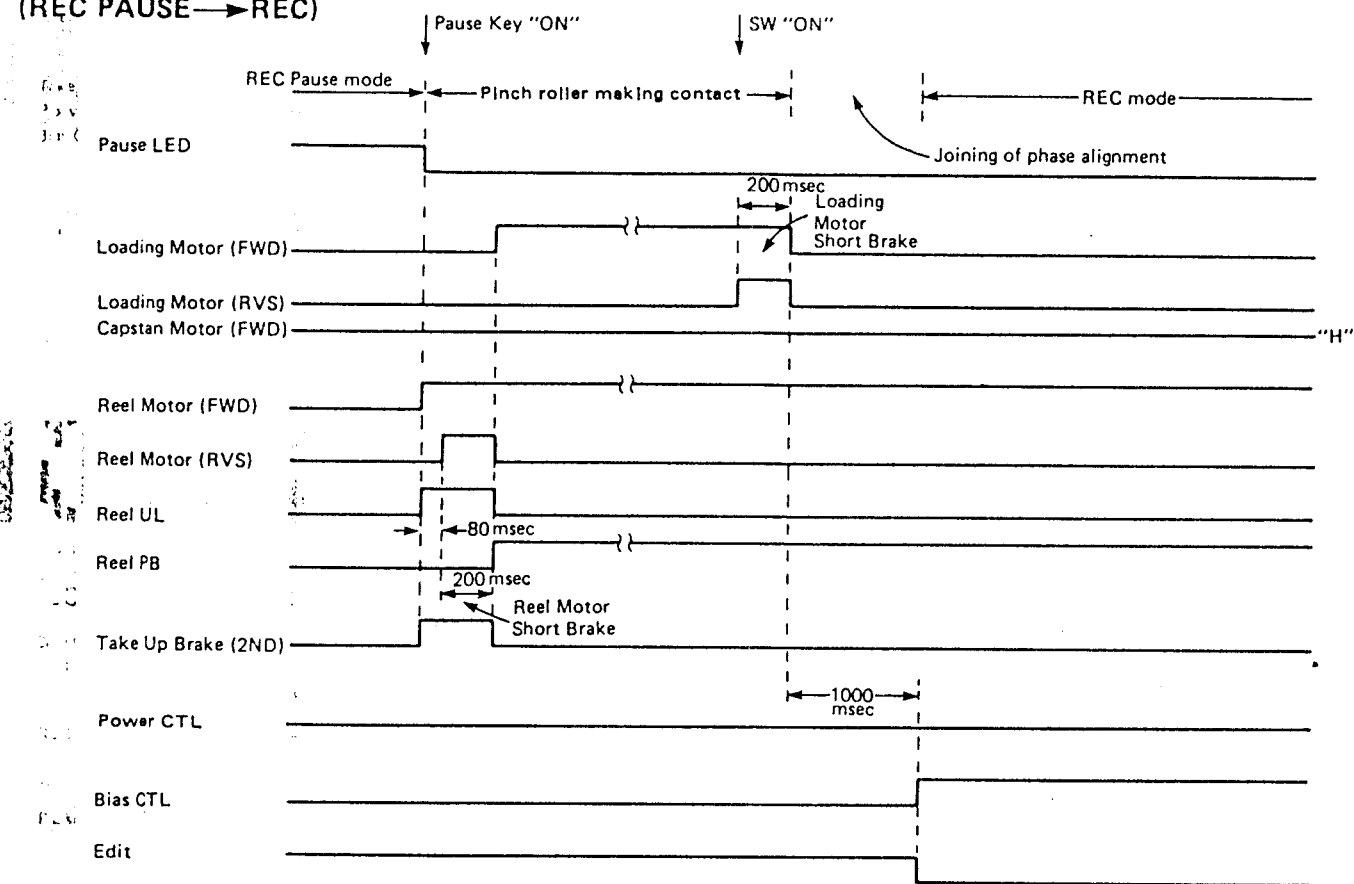


Figure 30. Timing Chart

(REC → REC PAUSE)

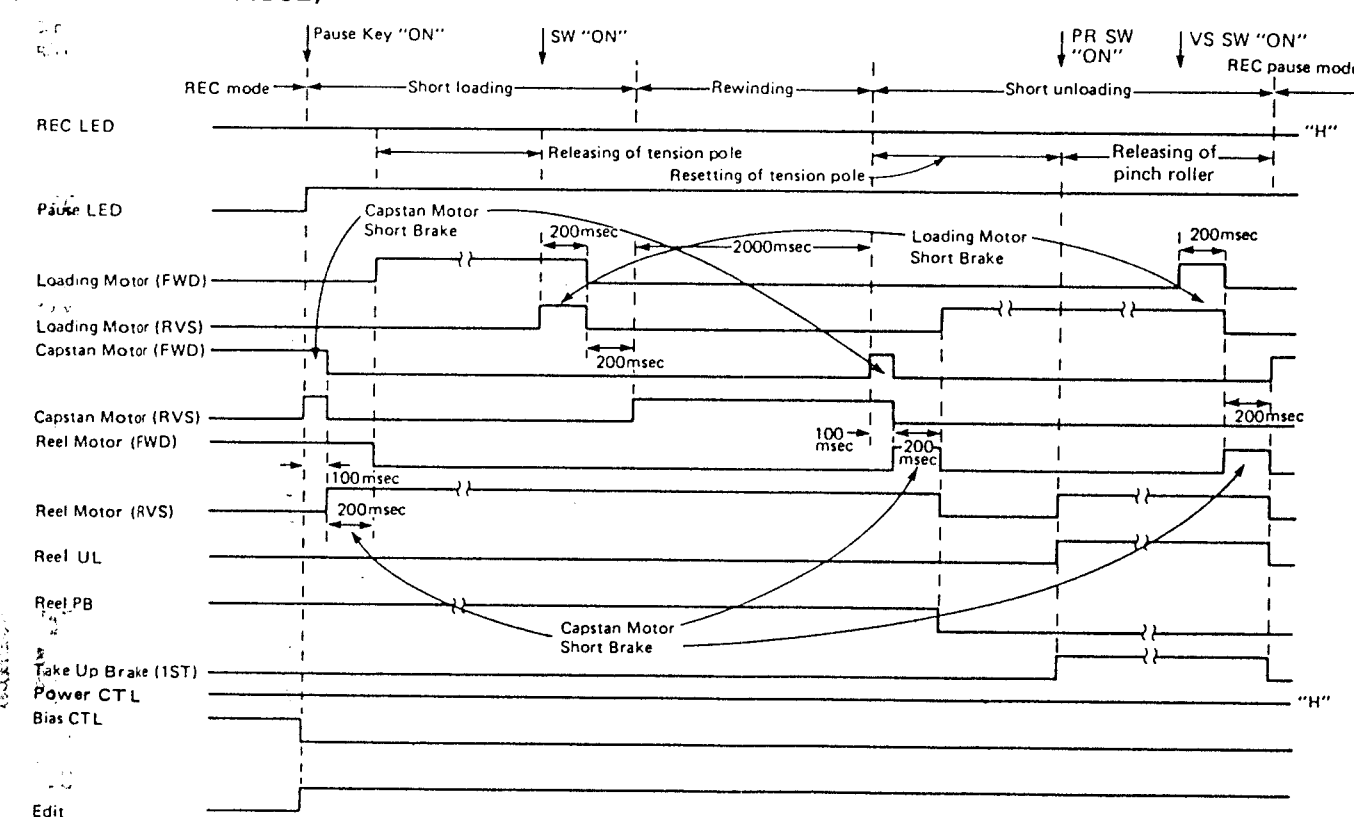


Figure 31. Timing Chart

10. DESCRIPTION OF POWER ON/OFF CIRCUIT

1. OUTLINE

The VC-5W20E includes two system control LSIs (IC801 for the Deck 1 and IC8001 for the Deck 2) and the power on/off circuit is designed to allow these two LSIs to turn on or off simultaneously when the power switch (SW8501) or the remote control power switch is turned on or off.

When the timer setting for the Deck 2 (in record mode) is stopped on the way or its set time has elapsed, the system control LSI of the Deck 2 automatically gets in OFF mode. And if the system control LSI of the Deck 1 is then at ON mode, the circuit produces the power switching pulse (II) to allow the Deck 2 to change from OFF mode to ON mode automatically.

While the Deck 2 is recording in record mode, the system control LSI of the Deck 2 is kept at ON mode. And if the system control LSI of the Deck 1 is then at OFF mode, the circuit produces the power switching pulse (I) to allow the Deck 2 to change from ON mode to OFF mode automatically.

2. CIRCUITRY OPERATIONS

When the power switch (SW8501) or remote control power switch is turned on, there is caused a power input switching pulse which is applied to pin ② of each system control LSI. And the system control LSI is designed to get active only when it receives High-level signal for 45 msec or more first and next Low-level signal for 45 msec or more. That is, if the signal which is applied to pin ② of the system control LSI stays at High level without changing to Low level, the LSI is not allowed to become active.

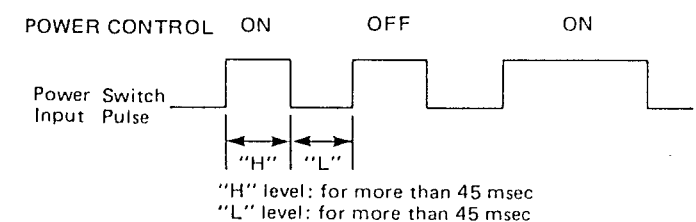


Figure 32.

To allow the two system control LSIs of both Decks to turn on and off surely at the same time, the comparative IC8009 is provided to give the power switch input pulse the hysteresis as characteristic shown below.

When the timer setting for the Deck 2 (in record mode) is stopped on the way or its set time has elapsed, the system control LSI of the Deck 2 automatically gets in OFF mode. Under this condition if the system control LSI of the Deck 1 is at ON mode, IC8008 functions to produce the power switching pulse (I) or (II) according to the condition (A) or (B) shown below, so that the Deck 2 is allowed to change from OFF mode to ON mode automatically.

- (A) Power switching pulse (I) = (P-CTL(I)) · (P-CTL(II)) · (TIMER LED(II))
 (B) Power switching pulse (II) = (P-CTL(I)) · (P-CTL(II)) · (TIMER LED(II))

For about 500 msec after AT 9V has been caused with the main power switch turned on, such muting occurs that Q3032 produces a High-level voltage to turn on Q8033, thereby to make ineffective the power switching key pulse. About 500 msec later, the AT9 line voltage will be stabilized. The High-level voltage of Q8032 is also applied to Q8033. With Q8030 turned on, triggering of IC 8002 is muted for about 500 msec.

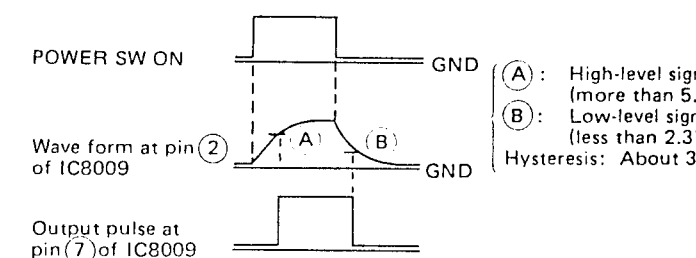


Figure 33.

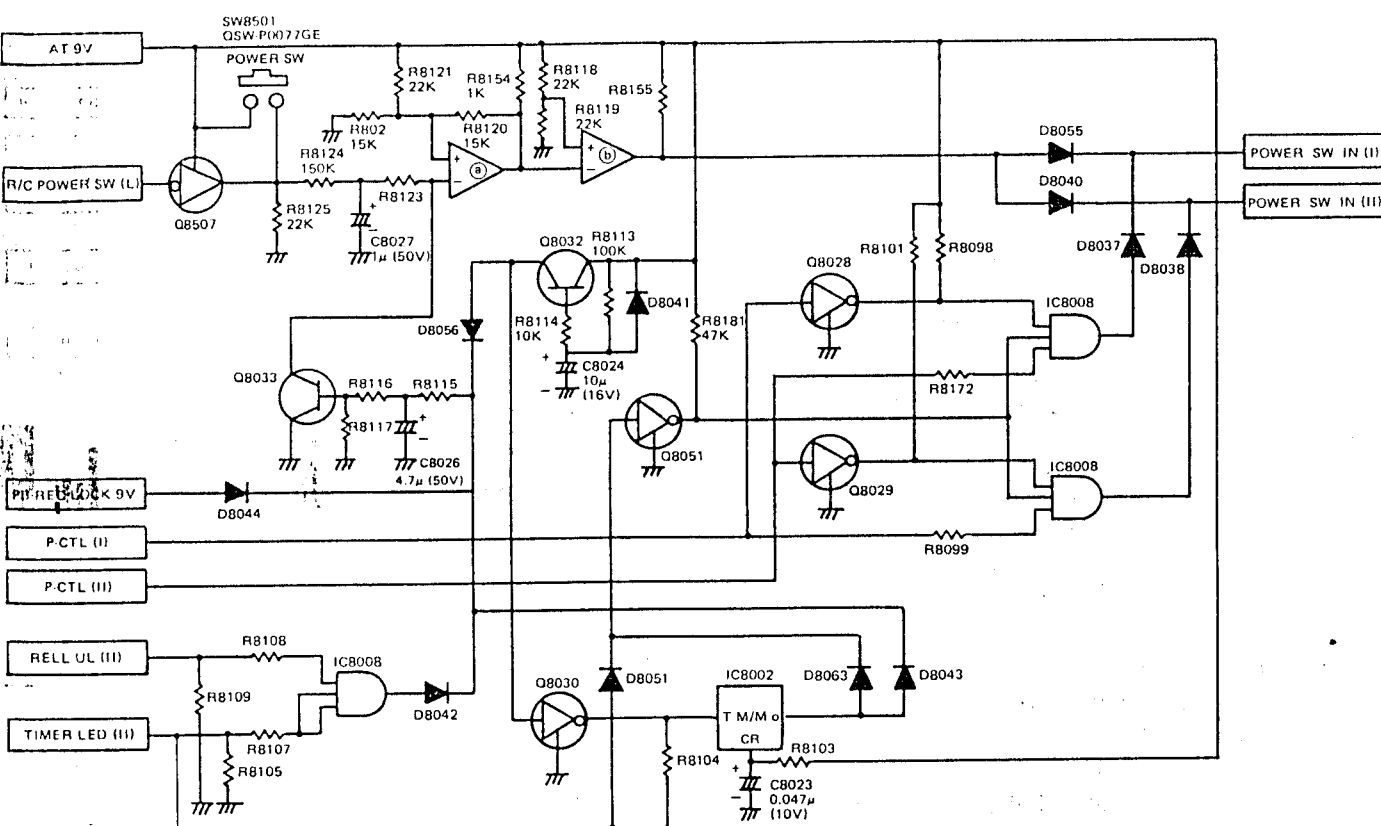
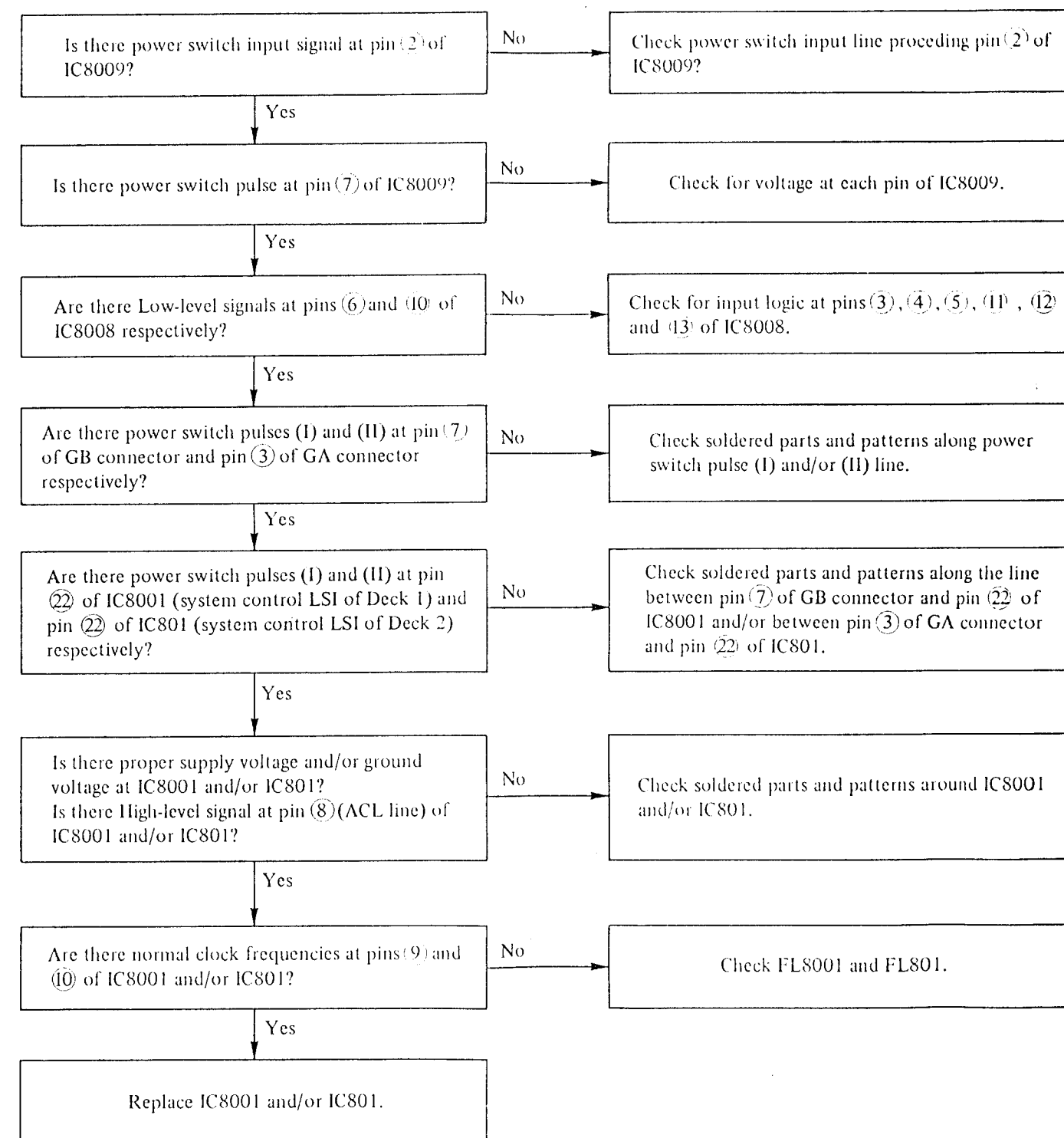


Figure 34. Power ON/OFF Circuit

11. TROUBLESHOOTING GUIDE

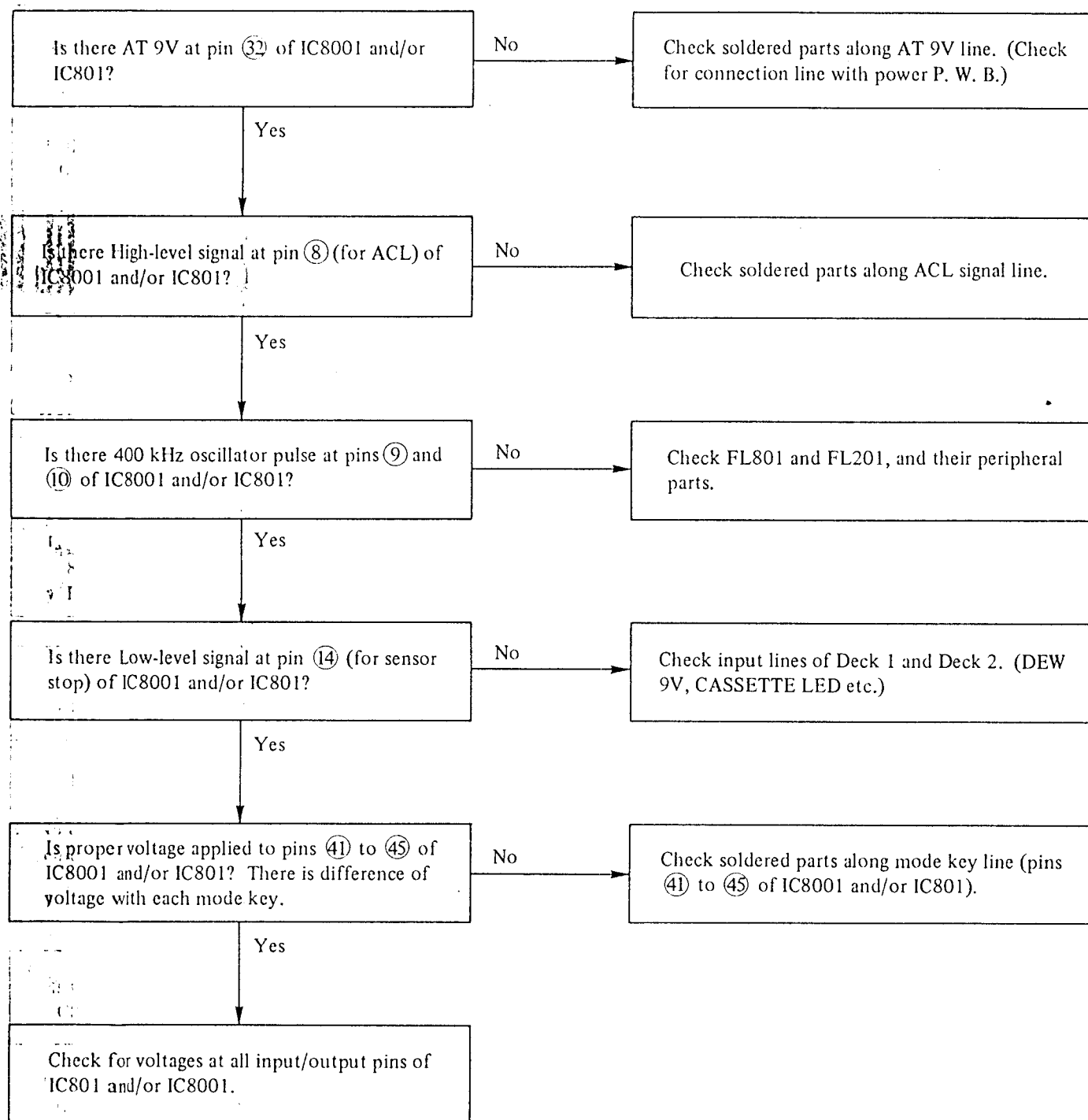
1. Power on/off operation is not available

Turn on and off the power switch repeatedly several times at the intervals of 1 second, then proceed with the checkings as shown below.



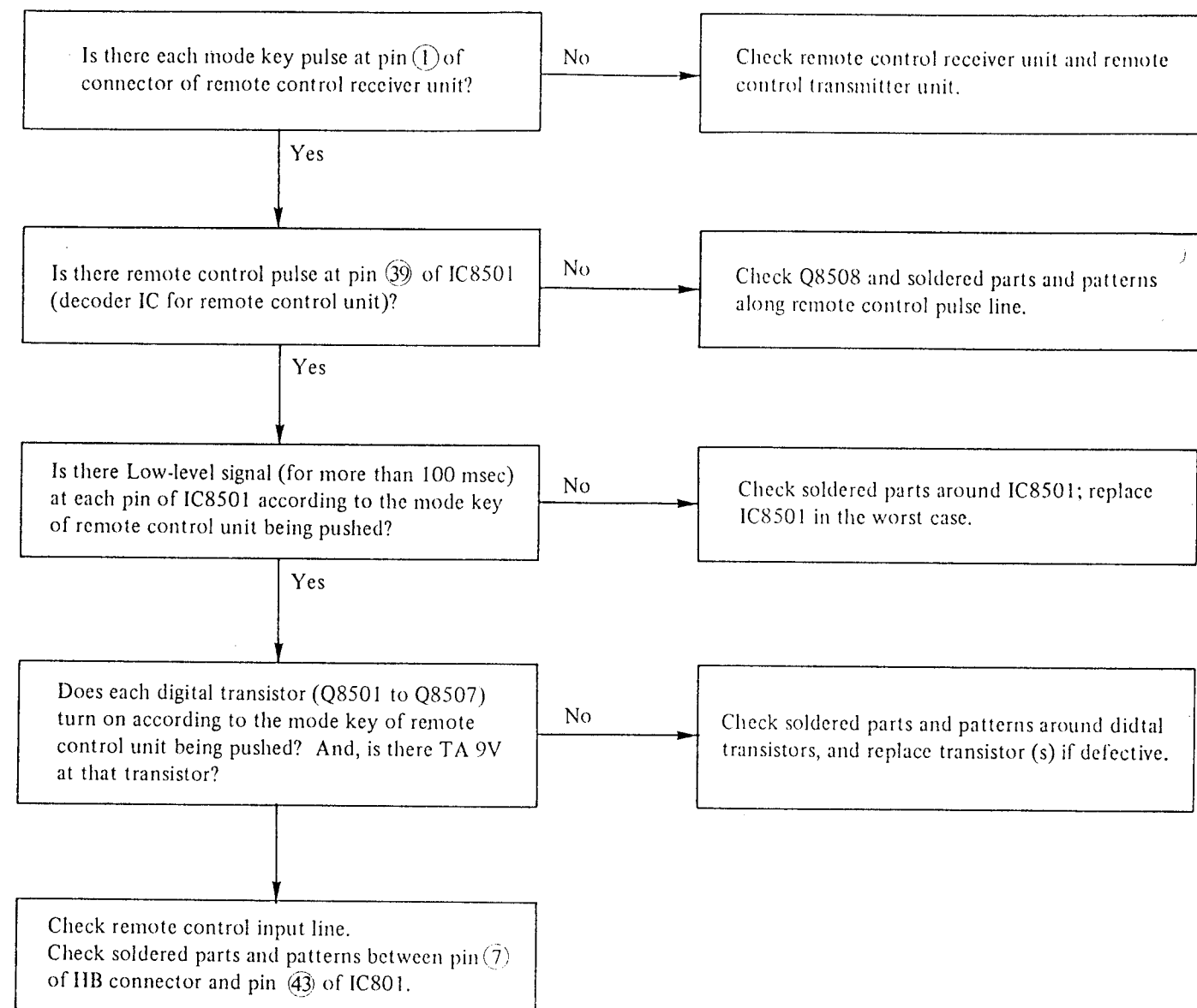
2. No operation of Mechanical control system and/or remote control system

1) Mechanical control is not available.



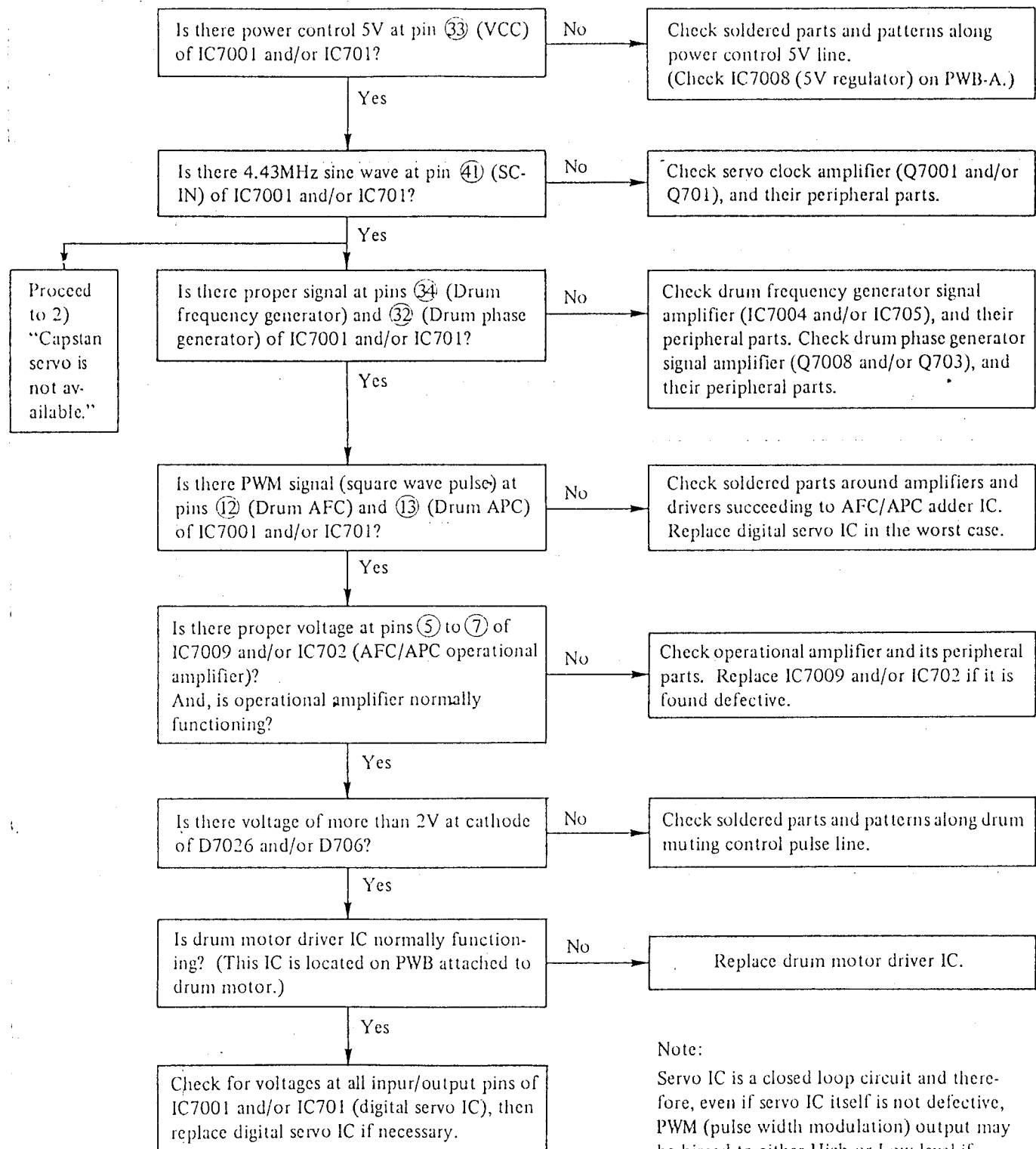
2) Remote control is not available.

Note) After the checkings in step 1) above, it is allowed to do the following checkings.



3. Troubleshooting of Servo Circuit

1) Drum servo is not available



Note:

Servo IC is a closed loop circuit and therefore, even if servo IC itself is not defective, PWM (pulse width modulation) output may be biased to either High or Low level if amplifier/output stage is defective; in this case, there appears no square wave pulse at pins 12 and 13 of IC7001 and/or IC701.

SHARP SERVICE MANUAL

S3526VC-5W20E

VHS VIDEO CASSETTE RECORDER

SUPPLEMENT

MODEL VC-5W20E

This supplement is issued for power regulator parts which is not listed up on VC-5W20E service Manual.

SHARP CORPORATION

PARTS LIST				REF. NO.	PART NO.	DESCRIPTION	CODE
PARTS REPLACEMENT				DIODES			
<p>Replacement parts which have these special safety characteristics identified in this manual; electrical components having such features are identified by Δ in the Replacement Parts Lists. The use of a substitute replacement part which does not have the same safety characteristics as the factory recommended replacement parts shown in this service manual may create shock, fire or other hazards.</p> <p>“HOW TO ORDER REPLACEMENT PARTS”</p> <p>To have your order filled promptly and correctly, please furnish the following informations.</p> <p>1. MODEL NUMBER 2. REF. NO. 3. PART NO. 4. DESCRIPTION 5. CODE</p>				Δ D01	95KUBB0032AZ	Diode (CTM-21S)	AH
				Δ D02	95KUBB0033AZ	Diode (CTM-21R)	AF
				D03	95KUBB0093BZ	Diode (CTU-21S)	AH
				D04	95KUBD0126CZ	Zener diode (RD15EB2)	AC
				D05	95KUBB0032AZ	Diode (CTM-21S)	AH
				Δ D06	95KUDA0014ZZ	Over voltage protector (8P1N)	AN
				D07	95KUBD0115AZ	Zener diode (RD5.1EB)	AC
				D08	95KUBD0031BZ	Zener diode (RD9.1JB1)	AC
				D09	95KUBD0132DZ	Zener diode (RD24EB3)	AB
				D10	95KUBD0133CZ	Zener diode (RD27EB2)	AB
				CAPACITOTS			
				Δ C02	95KUGFF473AW	.047 μ F, Ceramic	AB
				C03	95KUGZ0274ZZ	4700 μ F, 63V, Electrolytic	AR
				C04	95KUGAC682BU	6800 μ F, 16V, Electrolytic	AM
REF. NO.	PART NO.	DESCRIPTION	CODE	CONTROLS			
PRINTED WIRING BOARD ASS'Y (Not Replacement Item)				R09	95KUFZ0054ZZ	300 ohm, Pot., Over Current adj.	AD
	RUNTK0260GEZZ	Power circuit	—	R19	95KUFZ0054ZZ	300 ohm, Pot., All time 13.6V adj.	AD
TRANSISTORS				RESISTORS			
Q01	95KUAC0095CZ	Switching (2SC2579Y)	AL	R08	95KUDZ0019ZZ	Thermistor	AC
Q02	95KUAB0006CZ	Drive (2SB744A)	AF	IB01	95KUZZ0024ZZ	Resistor Array	AE
Q03	95KUAC0004AZ	Pre set drive (2SC945A)	AC	IB02	95KUZZ0026ZZ	Resistor Array	AE
Q04	95KUAC0004AZ	Over current detect (2SC945A)	AC	IB03	95KUZZ0025ZZ	Resistor Array	AE
Q05, 06, 07	95KUAA0028AZ	Protector (2SA988)	AH	COILS			
Q08	95KUAC0004AZ	Error amp. (2SC945A)	AC	L01	95KUKZ0035ZZ	Coil	AK
INTEGRATED CIRCUITS				L02	95K829030116	Coil	AP
IC01	95KUCZ0007ZZ	Oscillator and pulse width modulation (UPC393C)	AK	L03	95KUKZ0035ZZ	Coil	AK

POWER CIRCUIT SCHEMATIC DIAGRAM

